

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TENNESSEE
AT KNOXVILLE

MACTEC, INC.,)
Plaintiff,)
v.)
BECHTEL JACOBS COMPANY, LLC,)
Defendant.)
No. 3:05-CV-340
(Phillips)

FINDINGS OF FACT AND CONCLUSIONS OF LAW

This case arises out of alleged breaches of a subcontract for the design and construction of a hydraulic isolation system (“System”) for Solid Waste Storage Area 4 (“SWSA 4”), located in the Melton Valley area of the United States Department of Energy’s (“DOE”) Oak Ridge Reservation. The plaintiff, MACTEC seeks damages totaling \$9,177,422.19, including an unpaid subcontract balance and retainage of \$2,726,398.20, and claims for additional compensation of \$6,451,023.99. The defendant, Bechtel Jacobs Company, LLC (“BJC”), has asserted counterclaims against MACTEC totaling \$3,508,391.

A bench trial was conducted commencing August 27, 2007, and concluding September 6, 2007. Subsequent to the bench trial, the Court permitted the parties to supplement the record with any appropriate filings, which they have done. Further, the

Court ordered the parties to submit their respective proposed Findings of Fact and Conclusions of Law. The parties have done so, and having reviewed the evidence and the parties' proposed submissions, the Court hereby issues its Findings of Fact and Conclusions of Law pursuant to Fed. R. Civ. P. 52(a).

MACTEC's claims fall into two separate categories. The first is a collection of unresolved claims for additional compensation asserted as the product of changes, acceleration, and breaches of various expressed and implied obligations arising under the Subcontract. These claims have been submitted as Requests for Equitable Adjustments ("REAs"). Many REAs were resolved during the course of the Project. The REAs presented to the court are those that remain unresolved. The second claim is for unpaid Subcontract balance. The Court will first address all of MACTEC's unresolved REAs but one, and then turn to MACTEC's claim for Subcontract balance which includes one related REA, and includes a resolution of BJC's counterclaims for additional costs either to implement corrections to MACTEC's alleged defective work or to complete other work left undone by MACTEC on the SWSA 4 Project.

I. PRELIMINARY ISSUES

A. Identity of the Parties

1. Plaintiff MACTEC is a Colorado corporation with its principal place of business at 1105 Sanctuary Parkway, Suite 300, Alpharetta, Georgia 30004.

2. Defendant Bechtel Jacobs Company, LLC (“BJC”) is a Delaware limited liability company with its principal place of business at Highway 58, Blair Road, Oak Ridge, Tennessee 37830.

B. Jurisdiction

3. This Court has subject matter jurisdiction in that there is complete diversity of citizenship between the plaintiff and defendant and the controversy between them exceeds the sum of \$75,000, exclusive of interest and costs. 28 U.S.C. §1332(a).

C. The Project

4. SWSA 4 contains buried radioactive waste. BJC is a contractor retained by DOE to implement certain remedial measures to control contaminants at the Oak Ridge Reservation. BJC subcontracted to MACTEC the design and construction of a remediation system. The system to be designed and constructed by MACTEC was required by BJC to consist of (1) an upgradient diversion trench, (2) a landfill cap, (3) a collection underdrain along the current alignment of the SWSA 4 tributary at the southern edge of SWSA 4, and (5) a wastewater treatment facility. These are all remedial components of an overall system that were to be incorporated into MACTEC’s design in accordance with DOE’s Record of Decision conceptual design and stated objectives. Other measures to be taken as part of the same project included the removal of contaminated soils and vegetation at the Intermediate Holding Pond, wetlands restoration and other construction-related

activities. The components of the system were designated in the Record of Decision for Interim Actions for the Melton Valley Watershed at the Oak Ridge Reservation.

1. DOE's Contract With BJC

5. DOE operated a uranium enrichment facility at the K-25 Gaseous Diffusion Plant (now known as East Tennessee Technology Park (ETTP) which produced enriched uranium for, among other applications, nuclear weapons. In December 1997, DOE awarded a five-year, \$2.5 Billion contract to BJC whereby DOE and BJC would engineer a transition away from operations towards closure of the Oak Ridge facility.

2. The Record of Decision

6. DOE issued a Record of Decision ("ROD") for the Melton Valley Project. (Pl. Ex. 55, Vol. 23.) A ROD identifies the location of any and all contaminants on a project site after an investigation is performed and is usually issued on environmental clean-up projects. (Tr. 8/27/07, 47:4-16.) The ROD documents the remediation that is desired by the governmental agency. (Tr. 8/27/07, 47:19-24.)

7. BJC drafted the ROD that is applicable to the SWSA 4 Project for DOE. (Tr. 8/27/07, 47:19-24.)

8. The SWSA 4 ROD identified a "selected remedy" for the Project and also listed the Scope of Work to address DOE's specified remedial action to be taken by the successful bidder. (Tr. 8/27/07, 50:18-25; Pl. Ex. 55, Vol. 23, Bates MACTEC SWSA 023023-023028.)

9. In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), DOE, EPA and Tennessee Department of Environment and Conservation (“TDEC”) agreed on a *Record of Decision for Interim Actions for the Melton Valley Watershed* (the “ROD”) describing certain remedial actions for SWSA 4 and the entire Melton Valley watershed. (D. Ex. 4.) The remedial actions described in the ROD included “a combination of...containment, stabilization, removal, treatment, monitoring and land use controls” with the expectation that these activities would significantly reduce the release of contaminants from Melton Valley into White Oak Creek, Melton Branch, their tributaries, and the Clinch River. (D. Ex. 4 at 087377.)

10. The components of the System were designated in the SWSA 4 ROD as Interim Actions for the Melton Valley Watershed at the ORNL. (Tr. 8/27/07, 48:1-5.) The interim actions were required to prevent further releases of contaminates from Melton Valley into White Oak Creek. (Tr. 8/27/07, 53:9-18.)

11. The ROD for Interim Actions “presents the selected remedy for [SWSA 4] waste site” and provides that “[t]he selected remedy is interim until a final ROD is completed for Melton Valley.” (Pl. Ex. 55, Vol. 23, Bates MACTEC SWSA 023021.)

12. The ROD provides for: (a) upgradient diversion trenches; (b) multi-layered caps; and, (c) trenches downgradient of capped areas and water treatment facilities as the selected remedy. (Pl. Ex. 55, Vol. 23, Bates MACTEC SWSA 023025-023026.)

13. Section 2.11.1.3 of the ROD specifically provides that “[t]he selected remedy includes construction and operation of the collection trenches downgradient of capped areas in SWSA 4 ... [and that] [c]ontaminated groundwater collected by the

downgradient drains will be treated before discharge." (Pl. Ex. 55, Vol. 23, Bates MACTEC SWSA 023095; Tr. 8/27/07, 62:17-64:3.)

D. The BJC/MACTEC Subcontract

14. Pursuant to its contract with DOE, BJC executed a Subcontract with MACTEC for the design and construction of the SWSA 4 System, located in the Melton Valley area of the United States Department of Energy's Oak Ridge Reservation ("Subcontract"). (Tr. 8/27/07, 85:2-8; Pl. Ex. 57, Vol. 24-25.)

15. The Subcontract required the system designed and installed by MACTEC to manage a specified waste disposal site, to protect workers from contaminated water, to meet surface and groundwater quality levels in the SWSA 4 tributary within two years after completion of SWSA 4 remedial measures, and to mitigate further impact to groundwater.

16. Generally, MACTEC's Subcontract scope of work was to design and construct a "hydraulic isolation system" for SWSA 4 that included diverting upgradient groundwater and surface water, collecting downgradient groundwater, and constructing a multi-layered cap over the SWSA 4 burial ground and associated areas (D. Ex. 1 at 52671). The scope of work also included remediation and restoration of certain wetlands in the holding pond downgradient of SWSA 4 (known at the Intermediate Holding Pond or "IHP"), as well as numerous other work elements. *Id.*

17. The System to be designed and constructed by MACTEC was required by BJC to consist of (1) an upgradient diversion trench, (2) a landfill cap, (3) a collection underdrain along the current alignment of the SWSA 4 tributary at the southern edge of SWSA 4, (4) a downgradient trench ("DGT"), along the east-southeast edge of SWSA 4,

and (5) a wastewater treatment facility ("WTF") to operate the DGT by removing contaminated water from the DGT and depositing the treated water into an Intermediate Holding Pond ("IHP") adjacent to the DGT. (Tr. 8/27/07, 89:1-13; Pl. Ex.57, Vol. 24, Bates PX0057.0070.)

18. Other measures to be taken as part of the Subcontract work included the removal of contaminated soils and vegetation at the IHP, wetlands restoration, and other construction-related activities. The components of the System were designated in the ROD.

19. The performance measures of the SWSA 4 System are described in Section 1.0 of the Scope of Work for the Remedial Action of the SWSA 4 Burial Ground and Intermediate Holding Pond, which is Exhibit D to the Subcontract ("Scope of Work"). The Scope of Work contains six measures to determine MACTEC's satisfactory performance of its Subcontract obligations:

- Successfully design, obtain U.S. Department of Energy (DOE) and regulator ... approval, construct, and start operation of all required components... [of the System];
- Ensure that within two years after SWSA 4 construction is complete, there is no contaminated groundwater and/or surface water release from SWSA 4 that would cause exceedences of AWQC [ambient water quality criteria] for protection of aquatic fish and aquatic life ... into the SWSA 4 Tributary at the confluence with White Oak Creek;
- Reduce contaminant release to surface water to annual average of 85 pCi/L in the SWSA 4 tributary at its confluence with White Oak Creek as a result of release reduction and interception and treatment of contaminated groundwater;
- Reduce groundwater throughflow in buried waste units by greater than 75% as measured by greater than 75% decrease in water level fluctuations above the seasonal low average water level ...;
- Meet the technical intent of TDEC [Tennessee Department of Environment and Conservation] solid waste closure regulations; and,

- Comply with all ARARs [applicable or relevant and appropriate requirements].

(Tr. 8/27/07, 89:14-25; 94:1-7; Pl. Ex. 57, Vol. 24, Bates PX57.0071-0072.)

20. The work elements in the Subcontract's Scope of Work are consistent with the prescribed work elements that were set forth in the ROD. (Tr. 8/27/07, 94:17-20; Pl. Ex. 57, Vol. 24, PX0057.0070-0071; Pl. Ex. 55, Vol. 23, Bates MACTEC SWSA 023026.)

E. MACTEC and Its Witnesses

21. MACTEC is the product of a number of mergers of engineering, consulting and construction companies that are, in part, involved in the characterization, clean-up and containment of radiologically contaminated sites. (Tr. 8/27/07, 37:22-40:3.) MACTEC and its employees have extensive experience in heavy civil construction, radiological remediation projects, and hydraulic isolation systems. (Tr. 8/27/07, 26:5-24; 38:25-39:20.)

22. Billy Reid is the Vice President of MACTEC Development Corporation, a subsidiary of MACTEC. (Tr. 8/27/07, 8:2-3.) He is the Division Manager of the Demolition and Remedial Services Division of MACTEC, Inc., and maintains his office in Oak Ridge, Tennessee. (Tr. 8/27/07, 8:4-6.)

23. Reid has worked his entire career in the field of construction. (Tr. 8/27/07, 13:11-22.) He started working on remediation projects in 1991. (Tr. 8/27/07, 9:4-6.) He is a registered certified environmental manager and environmental auditor and has worked as a draftsman, field engineer, senior construction engineer, estimator, senior

construction manager, and senior project manager before beginning his employment with MACTEC. (Tr. 8/27/07, 9:17-19, 13:11-22, 19:16-25, 36:23-24.) During his career, Reid has been involved in the design and construction of multiple hydraulic isolation systems. (Tr. 8/27/07, 23:5-21, 26:11-24, 30:12-25.) Some of the caps and trenches Reid worked on were very similar in nature to those installed on the SWSA 4 Project. (Tr. 8/27/07, 28:1-25, 31:1-19.) Reid worked with MACTEC's designers in preparing MACTEC's bid and estimate for the Project. (Tr. 8/27/07, 44:3-22.) Reid also periodically participated in Project meetings and was kept informed by the site personnel through conference calls at least once per month. (Tr. 8/27/07, 139: 2-17.)

24. Matt Foster is a MACTEC employee who is a projects controls analyst. (Tr. 8/28/07, 87:2-7.) His primary duty as a projects controls analyst is to create construction schedules, keep them maintained and updated during the Project, and control the Project's budget. *Id.* Foster holds a Bachelor of Science degree in Mechanical Engineering and served in the U.S. Navy where he studied for, but did not complete, a Master of Science degree in Management. (Tr. 8/28/07, 88:1-7.) He had three roles on the Project: (1) he was the Project's Project Controls Analyst, (2) he was the Project Manager and (3) he was the Scheduler. (Tr. 8/28/07, 100:2-104:25.) He would visit the Project several times a week as the Project Controls Analyst. *Id.* During his tenure as Project Manager, Foster spent all of his time at the Project site and was out in the field observing the work numerous times a day. (Tr. 8/28/07, 102:23-103:11.)

25. Mark Cade was MACTEC's Field Engineer who was primarily responsible for handling field changes as they occurred on the Project. (Tr. 8/30/07, 78:18-24.) Cade was physically located at the site and spent a third of his time in the field. (Tr.

8/30/07, 79:7-80:7.) Cade arrived at the site in October 2003 and departed in November 2005. (Tr. 8/30/07, 78:18-79:21.) Cade is a principal and chief engineer for MACTEC. (Tr. 8/30/07, 56: 20-21.) He is a professional, licensed engineer in Tennessee, Kentucky, and several other states. (Tr. 8/30/07, 58:5-11.) Cade earned a Bachelor of Science degree in Civil Engineering in 1979, and a Master of Science degree in Engineering in 1980 from the University of Louisville. (Tr. 8/30/07, 58:5-20.)

26. Jim Bowman was MACTEC's Superintendent on the Project who oversaw MACTEC's work on the cap, upgradient trench, IHP, Lagoon Road, borrow area, and haul road. (Tr. 8/27/07, 179: 4-16, 188:7-19.) Bowman was at the Project site every day. *Id.* Bowman has worked construction for over twenty (20) years and has been a weigh master, has operated construction equipment and has experience shooting grades and supervising topographical survey crews. (Tr. 8/27/07, 181:1-18, 184:2-14.)

27. Curtis Lowther is an accountant with MACTEC who has over ten years of accounting experience in the construction industry. (Tr. 9/4/07, 105:7-106:19.) Lowther is familiar with the Project and MACTEC's accounting system. (Tr. 9/4/07, 108:3-8.)

28. Ron Lewis is an engineer working with MACTEC's Portland office who has performed groundwater modeling since 1981. (Tr. 8/31/07, 143:4-144:15.) Lewis personally prepared the groundwater model for the Project. (Tr. 8/31/07, 152:9-22.) Lewis evaluated BJC's information that it provided to the various bidders to understand BJC's RFP and how best to hydraulically isolate SWSA 4. *Id.* Lewis also relied upon a number of slug tests that were provided by BJC in designing the various components of the SWSA 4 hydraulic isolation system. (Tr. 8/31/07, 176: 5-13.) Lewis was also personally involved in the 30/60/90 percent design review. (Tr. 8/31/07, 159:23-160:7.) Lewis obtained a

Bachelor of Science in Chemical Engineering in 1964 and a Master of Science in Chemical Engineering in 1966 from the University of Maine. He also obtained a Masters in Statistics in the mid 1990's from the University of Southern Maine. He studied for, but did not complete his Ph.D. (Tr. 8/31/07, 139:20-140:8.)

29. MACTEC proffered Dr. Peter Shanahan as its expert in groundwater hydrology and environmental engineering. (Tr. 9/4/07, 13: 10-16). Dr. Shanahan holds four degrees from the Massachusetts Institute of Technology ("MIT") related to Civil Engineering and also a Ph.D. in Environmental Engineering. (Tr. 9/4/07, 8:3-16.) Dr. Shanahan is a senior lecturer at MIT and also owns HydroAnalysis, Inc., a consulting engineering firm. (Tr. 9/4/07, 4:6-13.) For the past six years, Dr. Shanahan has taught many courses at MIT that involve hazardous waste remediation and the design and operation of landfills. (Tr. 9/4/07, 5:3-18.) HydroAnalysis, Inc. has been in existence for the past 20 years and provides consulting engineering expertise regarding hydrology, hydraulics, and computer modeling to numerous environmental businesses. (Tr. 9/4/07, 6:7-15.) Before becoming a professor at MIT, Dr. Shanahan worked at various engineering firms throughout the world, working on various hazardous waste sites and Superfund sites. (Tr. 9/4/07, 10:7-11:12.) Dr. Shanahan is a registered professional engineer in the State of Maine and Massachusetts. (Tr. 9/4/07, 10:5-9.) Dr. Shanahan, through HydroAnalysis, Inc., prepared a report on the SWSA 4 Project after interviewing MACTEC's engineers and evaluating various site documents, including but not limited to, reports, memoranda, pumping tests data, and the SWSA 4 PCCR. (Tr. 9/4/07, 21:11-22:5, 23:2-14; Pl. Ex. 518, Vol. 41.)

30. MACTEC proffered Joe DuPree as a cost and scheduling expert. (Tr. 8/31/07, 14:4-9.) Over the past 30 years, DuPree has updated, monitored and prepared

construction schedules. (Tr. 8/31/07, 137:22-25.) As the owner of his own consulting firm, DuPree has developed contract claims in the construction industry associated with acceleration, extended program costs, delays, disruption, differing site conditions, changes in scope, as well as other impact claims. (Tr. 8/30/07, 265:7-267:17.) While preparing the extended program cost claim, DuPree performed a critical path method (“CPM”) analysis of the SWSA 4 schedules. (Tr. 8/31/07, 129:12-130:11.)

31. BJC objects to DuPree’s testimony as an expert witness. The admissibility of expert testimony in a federal court is primarily governed by Federal Rule of Evidence 702 which states:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

The reliability of the proffered expert testimony must involve an initial determination that the witness seeking to render the opinion is qualified to render an expert opinion in the designated area. Here, Dupree has 30 years experience preparing construction claims associated with acceleration, extended program costs, delays, disruption, differing site conditions, changes in scope, as well as other impact claims. He is clearly qualified to give expert testimony in his field of expertise in this case.

F. BJC’s Witnesses

32. Robert Spurling is currently employed as a project manager for BWXT working on the construction of a new steam plant at the Y-12 National Security Complex.

(Tr. 9/4/07,129:6-17.) Before joining BWXT in 2006, Spurling was employed by BJC starting in 1998. *Id.* at 129:23-25; 131:13-17.) Spurling has a Bachelor of Arts degree in Chemistry from Maryville College and a Bachelor of Science degree in Chemical Engineering from VirginiaTech. (*Id.*, 130:3-6.) He is a registered professional engineer in the State of Tennessee. (*Id.*, 130:10-11.)

33. Spurling began his professional career at BJC in 1989 (Tr. 9/4/07,130:12-14), and worked on several environmental remediation projects performing remedial investigations, feasibility studies and design of remedial actions. (*Id.*, 130:17-131:13; 132:15-133:4.) Before becoming involved in SWSA 4, he served as BJC Project Manager for the Bear Creek Watershed Record of Decision, as well as for the remedial action for the Boneyard/Burnyard facility in the Bear Creek Valley. (*Id.*, 132:15-133:4.)

34. Spurling became involved in the Melton Valley Hydraulic Isolation Project in December 2000, and was the Subcontract Technical Representative (STR) during the design phase of the Subcontract. (Tr. 9/4/07, 132:6-133:16.) Thereafter he was the “Task Lead” for SWSA 4, a position equivalent to a Deputy Project Manager. (*Id.*, 133:8-10.) In 2003, Spurling became Project Manager for SWSA 4 as well as the “balance of caps” work elsewhere in Melton Valley. (*Id.*, 133:25-134:3; 135:6-13.) As Project Manager, Spurling was responsible for the day-to-day operations, and was routinely involved in the communications and discussions between BJC and MACTEC about completion of the work at SWSA 4.

35. Frank Cater is a senior engineer with BJC, currently working on the K-25, K-27 demolition and decommissioning project. (Tr. 9/4/07, 229:3-9.) He has been employed by BJC since 2000. (*Id.*, 229:20-23.) Cater has a Bachelor of Science in Civil

Engineering from the University of South Florida. (*Id.*, 230:1-3.) His professional background involves working for several engineering firms on environmental remedial investigations and implementation of remedial actions. (*Id.*, 230:7-233:25.)

36. In 2003, Cater became involved in the Melton Valley Hydraulic Isolation Project as the Project Manager for the design efforts relating to the “balance of caps” within Melton Valley. (Tr. 9/4/07, 235:7-13.) In that role, Cater led the design efforts for the caps, downgradient trenches and upgradient trenches for the other SWSA 4 waste disposal areas, as well as the centralized water treatment facility for Melton Valley. (*Id.*, 235:15-236:13.)

37. In June 2005, Cater became the full-time Task Lead for the investigation surrounding the problems in the downgradient trench constructed by MACTEC at SWSA 4. (Tr. 9/4/07, 237:8-12.) Cater was the technical lead for the investigation and was responsible for managing and assembling the necessary technical resources to complete the investigation. (*Id.*, 238:11-21.) Cater was involved in the decision to conduct the October/November 2005 pump tests and remained involved with SWSA 4 during that testing and through the implementation of the corrective work thereafter. (*Id.*, 238:5-10.) Cater was the primary author of the Phased Construction Completion Report for SWSA 4 that provides verification that the remedial actions taken at the site were implemented as designed, for approval by the relevant regulatory agencies. (Tr. 9/5/07, 265:20-24.)

38. Michael Sholley is currently a principal engineer at BJC (Tr. 9/6/07, 4:1-2, 5:17-18) and has been employed by BJC for 30 years. (*Id.*, 4:1-4.) Sholley has a Bachelor of Science degree in Geologic Engineering from the University of Idaho and a Master of Science degree in geotechnical engineering from the University of California-Berkeley.

(*Id.*, 4:6-8.) He is a licensed professional engineer, professional geologist, certified engineering geologist and certified hydrogeologist in the State of California. (*Id.*, 4:11-17.) During his 30 year career, he has worked on numerous environmental projects involving remedial investigation, feasibility studies, remedial designs and remedial actions, as well as the planning and field implementation of pump tests. (*Id.*, 6:6:1-10:19.)

39. In August 2005, Sholley became involved in the SWSA 4 project. (Tr. 9/6/07, 10:20-23.) His role was to review and evaluate the testing data from the May 2005 pump test and to develop the scope of work for further testing. (*Id.*, 11:1-6.) He was one of the hydrologists present on site during the October/November 2005 pump tests to monitor the testing, make adjustments as needed, and record data. (*Id.*, 17:2-18:2.) Based on his review of the data collected, Sholley made recommendations for corrective measures to the DGT. (*Id.*, 21:3-22:10.)

40. Mary Beth Blair is the Planning and Budget Manager for BJC. (Tr. 9/5/07, 194:24-195:1.) Her role as Planning and Budget Manager involves all aspects of funds management for BJC, including maintaining the cost model, calculating and monitoring overhead rates, and overseeing accounts receivable, payroll and benefits accounting. (*Id.*, 195:14-23.) The total value of BJC work for which she is responsible for planning and budget is \$1.4 billion, or approximately \$400 million per year in expenditures. (*Id.*, 201:15-20.) She reports to the Chief Financial Officer of BJC. (*Id.*, 201:13-14.) She has a Bachelor of Science degree with a concentration in Finance and a Masters in Business Administration with a concentration in Management (*Id.*, 199:23-25), and is a Certified Public Accountant in the State of Tennessee. (*Id.*, 200:2-5.)

41. George Pinder is a Professor at the University of Vermont with a primary

appointment in Civil and Environmental Engineering and secondary appointments in the Department of Computer Science and the Department of Mathematics and Statistics. (Tr. 9/6/07, 59:15-20.) Within the area of civil and environmental engineering, his area of expertise is groundwater hydrology. (*Id.*, 59:23-24.) He also serves as director of the Research Center for Groundwater Remediation Design, a group of research faculty dedicated to finding least cost solutions to groundwater contamination problems primarily using computer models. (*Id.*, 60:5-10.)

42. Dr. Pinder received his undergraduate degree in Geology from the University of Western Ontario, and he obtained a three-part doctorate from the University of Illinois at Champaign-Urbana in Civil Engineering, Geology and Hydronomical Statistics. (Tr. 9/6/07, 61:3-8.) After completing his doctorate, Dr. Pinder worked as a research hydrologist for the U.S. Geological Survey before becoming an Associate Professor of Civil and Geological Engineering at Princeton, ultimately rising to Chairman of the department for nine years. (*Id.*, 62:23-18.) In 1989, Dr. Pinder went to the University of Vermont and served as Dean of the College of Engineering and Mathematics. (*Id.*, 64:11-14.) After seven years as Dean, he returned to teaching, and teaches courses in groundwater hydrology, physics of flow through porous media, groundwater modeling and advanced groundwater hydrology. (*Id.*, 60:16-25, 64:12-14.)

43. In addition to his academic duties, Dr. Pinder performs consulting work to advise on remediation of groundwater contamination. (Tr. 9/6/07, 64:18-65:15.) He has been retained to provide quality assurance advice for major groundwater remediation projects including, among others, Love Canal and the Ciba-Geigy site in Toms River, New Jersey. (*Id.*)

II. MACTEC'S REAs

44. During the course of Subcontract performance, MACTEC performed additional work, and performed work under conditions above and beyond that contemplated by the Subcontract. MACTEC submitted claims for additional compensation during the course of the Project by way of Requests for Equitable Adjustment (REA). Many REAs were settled, but toward the conclusion of the Project, BJC ceased negotiating REAs and claims for additional compensation with MACTEC. As a result, MACTEC has submitted unresolved REAs and claims for additional compensation. In addition, MACTEC asserts it is owed \$2,726,398.20 in subcontract balance and retainage which has not been paid. Generally, MACTEC's outstanding REAs and claims for additional compensation consist of: (1) acceleration costs incurred by MACTEC due to impacts beyond its control; (2) damages for BJC directed changes to MACTEC's planned sequence of work; and (3) costs associated with differing site conditions encountered by MACTEC.

A. REA 66 – Acceleration Due to Weather Delays

45. MACTEC's REA 66 seeks recovery for the premium portion of all overtime worked and paid by MACTEC from May 25, 2004 through February 20, 2005, to attempt to meet the unextended completion date that MACTEC contends was due to be extended as the result of unusually severe weather. (Tr. 8/28/07, 154:22-156:3.)

46. Matt Foster testified that MACTEC planned in its original baseline schedule that there would be 20% weather impacts on the Project. (Tr. 8/28/07, 152:10-24.)

47. MACTEC was required to re-baseline its original schedule because BJC issued a partial work suspension due to BJC funding issues. (Tr. 8/28/07, 101:2-13.)

48. Subsequent to the BJC-ordered suspension of work, the “complete all field work” milestone was revised to March 31, 2004. (Pl. Ex. 4, Vol. 1, Bates PX0004.0176.)

49. Subsequent to the recommencement of work after the partial work suspension, the Project experienced a substantial amount of unusually severe weather. (Tr. 8/28/07, 121:13-20.)

50. MACTEC started its actual cap work on November 1, 2002, near the beginning of the recognized wet season. (Tr. 9/5/07, 180:25-181:9.)

51. By October 2003, MACTEC had submitted to BJC several schedule updates requesting an extension of the schedule completion date due to unusually severe weather conditions that had been experienced throughout 2003. (Tr. 9/5/07, 99:14-19; Pl. Ex. 301; Pl. Ex. 317; Tr. 8/30/07, 17:7-18:12; Pl. Ex. 8C, Vol. 3; Pl. Ex. 8G, Vol. 3.) BJC rejected these revised schedules because they showed a completion date beyond the complete all field work date of March 31, 2004. (Tr. 9/5/07, 104:12-23; Def. Ex. 310, Vol. 4; Pl. Ex. 544, Vol. 31; Tr. 8/30/07, 22:3-25.)

52. From February 2003, through February 2005, MACTEC was requesting time extensions from BJC for unusually severe weather. In response, BJC consistently rejected the time extension requests and informed MACTEC that it was behind schedule, and directed that MACTEC do whatever was necessary in order to meet the unextended Subcontract completion dates. (Tr. 8/28/07, 126:4-19; Tr. 9/5/07, 100: 1-7, 100:19-25, 102: 2-11, 104:7-23.)

53. BJC was both monitoring the weather and capable of observing the weather as it was impacting the job on an ongoing basis. BJC was aware when the Project was experiencing unusually severe weather on a weekly and monthly basis. (Tr. 9/5/07, 103:6-14.)

54. MACTEC contemporaneously tracked the unusually severe weather in its schedules. A few examples of the unusually severe weather impacts recorded during the 2003 and 2004 time period follow: 12/9/03 rain, no earth work; 12/10/03 rain, no work; 12/11/03 muddy, 25% productivity; 12/12/03 muddy, 25% productivity; 12/15/03 rain, no work; 12/17/03 rain overnight, no work, training; 12/18/03 snow, no work; 12/19/03 muddy, no work except surveying; 12/30/03 rained overnight, no cap work; 12/31/03 cap still muddy, worked borrow area; 1/5/04 rain, no work; 1/6/04 muddy, no work; 1/7/04 muddy, no work; 1/8/04 muddy, no work; 1/9/04 muddy, no work; 1/12/04 muddy, no work; 1/13/04 muddy, no work; 1/14/04 muddy, no work; 1/17/04 Sat. contour fill till 1400 then rain; 1/18/04 Sun., heavy rain; 1/19/04 muddy, no cap work; 1/20/04 muddy, no cap work; 1/25/04 Sun. rain, no work; 1/26/04 wet, muddy, no dirt work; 1/27/04 rain, wet, no cap work; 2/2/04 contour fill til 1400, then rain; 2/3/04 cap wet, worked GUT trench; 2/4/04 cap wet, worked BUG trench; 2/12/04 early AM rain, no cap work; 2/13/04 cap too wet for dirt work; 2/14/04 cap too wet for dirt work; 3/3/04 too wet for cap work; 3/4/04 too wet for contour, placed protective; 3/6/04 2.5% rain overnight, no work; 3/8/04 too wet for contour, placed protective; 3/19/04 too wet for dirt work; 4/19/04 rain, no cap work; 4/20/04 rain, no cap work; 4/21/04 inefficient due to mud; 5/5/04 T-storm at 0830 stopped dirt work; 5/10/04 no weather impact until T-storm @ 1700; 5/11/04 cap wet from prev day, no dirt work; 5/12/04 lightning & 1600 stopped field work; 6/1/04 cap too wet for dirt work & GCL; 6/2/04

reworking storm damage, PM T-Storm; 6/3/04 reworking storm damage; 6/23/04 too wet for CGL, all stopped at 1300; 7/6/04 Cap very wet, no dirt or liner work; 7/7/04 cap still wet, no liner or dirt work; 7/19/04 cap wet, repairing storm damage, resand; 8/2/04 rework damage from Sat. rain; 8/5/04 rain @ 0930 stopped all work for day; 8/12/04 heavy rain, no work; 8/13/04 cap very wet, no work; and 8/14/04 cap questionable, no work. (Pl. Ex. 11AM, Vol. 4, Bates MACTEC SWSA 075144-075158.)

55. BJC rejected MACTEC's schedule updates dated November 25 and December 12, 2003; January 2, 9, 16, 23 and 30, 2004; February 13 and 27, 2004, March 5, 12, 19 and 26, 2004; April 2, 9, 19 and 23, 2004; May 3, 10, 17, 24 and 28, 2004; June 14, 18 and 28, 2004; July 5, 16, 23 and 30, 2004; August 6, 13, 20 and 27, 2004; September 3, 10 and 24, 2004; October 1, 8, 15, 22 and 29, 2004; November 5, 12, 19 and 26, 2004; December 3, 10, 17 and 31, 2004; January 7 and 19, 2005; and March 11, 2005, all of which requested relief from poor weather conditions. (Tr. 8/30/07, 24:18-28:8; Pl. Ex. 567.)

56. BJC's letter of December 17, 2003 threatened termination. *Id.* The reference to the Subcontract's termination clause in project correspondence was acknowledged by BJC as a threat BJC intended to make to MACTEC. (Tr. 9/5/07, 164:10-21.) The threat of terminating the Subcontract was an extremely serious threat because if terminated a contractor could lose its bonding capacity as well as ensure that the contractor would never again work on a federal government project. *Id.*

57. BJC also sent a separate letter to MACTEC dated August 19, 2004, with a threat of termination in the midst of MACTEC's repeated requests for schedule extensions due to unusually severe weather. (Tr. 8/30/07, 28:13-17; Pl. Ex. 8E, Vol. 3.)

58. Based on claims of MACTEC's alleged failures to meet schedule, BJC repeatedly threatened to terminate MACTEC during the course of the Project. (Tr. 9/5/07, 164:4-21; Pl. Ex. 544, Vol. 41; Pl. Ex. 8E, Vol. 3.)

59. During calendar year 2004, while MACTEC's repeated requests for time extensions were denied, BJC demanded that MACTEC attempt to achieve the unextended completion dates in the Subcontract, and MACTEC attempted to do so by re-sequencing its work, working premium time, overtime, and working on days that were marginal. (Tr. 8/28/07, 129:20-130:4, 131:2-23.)

60. MACTEC's cap work is classified as dirtwork. (Tr. 8/28/07, 24:4-18.) It took MACTEC longer to install the cap because of the unusually severe weather conditions MACTEC experienced. *Id.* This unusually severe weather had a negative impact on the dirtwork associated with the cap. *Id.*

61. If appropriate time extensions for unusually severe weather had been granted by BJC, MACTEC would have waited until the site had dried out, and thereafter proceeded in accordance with its original logic and with control of its overtime expenditures. (Tr. 8/28/07, 130:21-131:1.)

62. BJC directed MACTEC to accelerate its work and issued recovery schedules while MACTEC experienced unusually severe weather impacts. (Tr. 9/5/07, 102:2-21.)

63. While on the one hand, BJC consistently rejected MACTEC's request for time extensions, BJC itself received a time extension from DOE for unusually severe weather conditions encountered during 2003. (Tr. 9/5/07, 169:1-170:21; Pl. Ex. 15, Vol. 10 meeting minutes dated January 14, 2004, Bates BJC SWSA4-61932.) On January 14,

2004, BJC received 65 days of time extension due to unusually severe weather for calendar year 2003. *Id.* Yet, at the same time, BJC informed MACTEC that it was not entitled to a single day of time extension for unusually severe weather. *Id.* MACTEC suffered from the same unusually severe weather on the Project, approximately 250 percent of the assumed rainfall, as did BJC. *Id.* Instead of granting MACTEC a time extension, BJC threatened MACTEC with termination. *Id.* In addition, BJC also threatened to seek additional compensation from MACTEC because of the unusually severe weather delay experienced on the Project. (Tr. 9/5/07, 172:5-18; Pl. Ex. 8E, Vol. 3.)

64. During this time of BJC-directed acceleration, MACTEC continued to work in unusually severe weather conditions which resulted in much of the cap work becoming a “sloppy mess” and turning into, for “lack of a better term, a mud hole.” (Tr. 8/28/07, 24:4-18.)

65. MACTEC advised BJC by letter dated April 19, 2004, of ongoing weather impacts experienced at the site, and MACTEC’s ongoing acceleration due to BJC’s insistence that MACTEC meet the unextended Subcontract completion milestones. (Pl. Ex. 8B, Vol. 3; Tr. 8/28/07, 136:16-138:2; 138:20-139:9.)

66. BJC admitted that it was directing MACTEC to adhere to its schedule and accelerate its work, during June 2004, July 2004 and August 2004. (Tr. 9/5/07, 104:7-23.)

67. Meanwhile, BJC reaped the benefits of MACTEC’s accelerated work by being paid 100% of its Performance Based Incentives (“PBI”) associated with MACTEC’s work. (9/5/07, 110:1-112:21.) BJC earned 100% of each of the three PBIs on the Project as a direct result of MACTEC completing its work on time. *Id.* BJC earned a total of \$2,276,400 in PBIs related to MACTEC accelerated work. *Id.*

68. Shortly after MACTEC accelerated, resequenced and redirected its work at BJC's direction, and BJC earned its PBIs totaling \$2,726,400, BJC demanded Matt Foster be replaced as MACTEC's Project Manager due to a claimed failure to meet schedule. (Tr. 9/5/07, 100:13-16.) As of October 2003, when Foster was replaced, BJC had not granted to MACTEC a single day in time extensions. (Tr. 9/5/07, 99:23-25; Def. Ex. 110.)

69. Had MACTEC performed its cap work in dry conditions, MACTEC would not have had the problems it ran into. (Tr. 8/28/07, 27:2-8.)

70. BJC finally acknowledged that MACTEC was entitled to time relief after MACTEC finished its work in February 2005, despite being aware that MACTEC was experiencing unusually severe weather in 2003 and 2004. (Tr. 9/5/07, 103:13-20; Pl. Ex. 20B3, Vol. 19; Tr. 9/5/07, 101:9-15.)

71. REA 66 was originally a claim for the premium time MACTEC paid its employees during the time period of December 9, 2003 until February 20, 2005. (Tr. 8/28/2007, 133:1-18)

72. The summary sheet for REA 66 lists each employee from MACTEC's cost database who was paid premium time from December 9, 2003 until February 20, 2005 and the dollar value of the premium time. (Tr. 8/28/2007, 135:11-23; Pl. Ex. 8, Vol. 3.) The cost backup information is derived from MACTEC's Oracle Cost database. (Tr. 8/28/2007, 136:7-11; Pl. Ex. 12A, Vol. 4.)

73. Because a previously settled REA may have included premium time projected through May 24, 2004, MACTEC revised REA 66 down from \$434,000 to \$233,800 to exclude premium time prior to May 24, 2004. (Tr. 8/28/2007, 154:22-156:3)

74. At trial, Foster admitted that certain premium time costs claimed in REA 66 duplicated those for which MACTEC already had obtained compensation, by way of settling REA 39 as part of Modification 32. The duplicated premium time was all premium time incurred from December 8, 2003 through May 24, 2004. (Tr. 8/29/07, 179:14-180:12.) Foster reduced REA 66 to \$233,800 in his testimony to reflect this. (Tr. 8/29/07, 167:16-18.)

75. By Modification 32, dated February 11, 2005, the parties agreed to an increase in MACTEC's Subcontract price to "reflect incorporation of settlement price for REAs [35, 39 and 40]," in the total amount of \$856,000. (D. Ex. 1, Mod 32 at 105962.) Additionally, Modification 32 revised the Subcontract date for "Complete All Field Work" (as set forth in Exhibit B to the Subcontract) "to reflect schedule impact of the REAs [35, 39 and 40]." *Id.* The relevant date was extended from March 31, 2004 to September 8, 2004. *Id.*

76. REA 39, one of three substantial REAs settled in Modification 32, was titled, similar to REA 66, "acceleration in lieu of time extension for weather impacts." *Id.* It related to claimed weather impacts in a period before that addressed in REA 66, but also included claimed acceleration of MACTEC's work efforts through overtime thereafter, in the same time period as addressed in REA 66 as submitted. (*Id.* at 110570.) Specifically, MACTEC's April 19, 2004 submittal of REA 39 asserted "premium time costs... from the date major field activities were resumed on 08 December 2003 until the [then proposed] severe weather adjusted interim completion milestone for 'Complete All Field Work' of 24 May 2004." *Id.* This is the first duplication of claimed costs that was acknowledged by Foster at trial, and that led him to reduce the amount claimed in REA 66 from \$434,000 to \$238,300. (Tr. 8/28/07, 155:12-24.)

77. REA 40 was another of the three substantial REAs settled as part of Modification 32. REA 40 claimed costs attributed to an “extension of SWSA 4 project due to external schedule impacts.” (D. Ex. 1, Mod 32 at 105962.) MACTEC’s April 19, 2004 submittal of REA 40 asserted “increased costs... associated with anticipated premium time which will be required to improve the completion of all field work from the ‘Complete All Field Work’ interim completion milestone from the severe weather + external impact date of 03 January 2005... to the currently forecasted completion of all field work on 01 September 2004.” (D. Ex. 1, Mod 32 at 110571) As such, REA 40 contained a claim for projected premium time to recover schedule after the premium time ending May 24, 2004 in REA 39, and extending though the then-projected completion of field work on September 1, 2004. (*Id.* at 501458-61.)

78. At trial, Foster also conceded that premium time costs claimed in REA 66 between May 24, 2004 through September 1, 2004 were also duplicated, in this case by the claimed premium time costs for this period in REA 40, which like REA 39, was settled in Modification 32. (Tr. 8/29/07, 181:18-182:4.)

79. MACTEC’s claim accordingly includes a duplication of costs to the extent of all premium time claimed for the period May 25, 2004 to September 1, 2004. The amount of the duplication cannot readily be determined from the exhibits in the record, due to the manner in which the premium time is presented in Plaintiff’s Exhibit 8N (by employee name and not by date).

80. Because there is no way to determine whether the settlement of REA 40 included any payment for premium time through that date, the most conservative approach is to calculate REA 66 from September 1, 2004 forward. By computing REA 66 for the time

period of 9/1/2004 to 2/20/2005 there can be no duplication of costs which may have been included in any previously settled REAs. The total raw costs of craft premium time for the time period of 09/01/2004 to 02/20/2005 is \$45,917.17, as illustrated in the table below:

<u>Employee</u>	<u>Premium Raw Costs</u>	<u>Pl. Ex. 8N page #s</u>
Ariks, Billy J.	354.05	MACTEC SWSA 200588
Baker Jr. Roger D.	575.55	200591-92
Carroll, Brian G.	2,534.76	200595-96
Dawkins, Steven M.	1,089.97	200603
Dimmitt, Eric P.	213.60	200606
Dishman, David D.	488.96	200608-09
Duncan, Shannon J.	2,462.50	200610-12
Hamilton, Frederick J.	204.40	200615-16
Hensley, Misty D.	1,226.40	200618-19
Human, David A.	1,198.88	200622-23
Ingram, Jerry T.	2,657.00	200626-28
Kennedy, Robert H.	942.27	200631
Kessinger, Albert G.	1,100.16	200634-35
Lewis, Brenda L.	1,878.53	200640-42
Majors Jr., Roy V.	2,347.00	200645-47
Morgan, Charles T.	2,016.96	200650-51
Phillips, Ronald C.	1,379.70	200658-59
Posey, Denny L.	2,141.33	200662-63
Posey, Jody D.	921.89	200666
Rice, Kelby S.	565.75	200668
Richardson, David A.	2,039.13	200670-72
Ricker, Ronnie L.	534.00	200675
Robbins, Dewayne M.	534.80	200677
Rose, Steven H.	3,642.04	200680-82
Stephens, Anthony R.	2,108.48	200687-88
Taylor, William H.	1,266.55	200691
Wilkin, Troy E.	6,670.71	200696-99
Willis, Lonnie D.	860.77	200700-01
Willis, Roger L.	<u>1,961.03</u>	200705-06
	<u>45,917.17</u>	

(See Pl. Ex. 8N, Vol. 3.)

81. Applying the same standard markups (Fringe = 35%, Overhead = 36.31%, G&A = 9.37%, Profit = 10%) used in the original REA 66 to the premium time raw

cost provides a total burdened premium time cost for craft labor of \$101,654.71 for the time period of 09/01/2004 to 02/20/2005 (Pl. Ex. 8, Volume 3)

82. I find that MACTEC is entitled to \$101,654.71, exclusive of interest, for REA 66.

83. I find that MACTEC is entitled to interest beginning July 18, 2007, the date MACTEC submitted its claim to BJC. Based on the foregoing, I find that MACTEC is entitled to \$3,174.97 in prejudgment interest, computed at ten percent *per annum*, on the \$101,654.71 awarded for REA 66 for the time period commencing July 18, 2007 through December 31, 2007, and is entitled to interest in the daily amount of \$27.85 from January 1, 2008 until the date judgment is entered.

B. REA 69 – Additional Vent Stone

84. MACTEC's REA 69 seeks recovery for additional vent stone required for the Project as a result of site conditions encountered due to BJC's refusal to grant time extensions to accommodate the unusually severe weather experienced in 2003 and 2004, and the requirement that MACTEC accelerate its work and proceed in poor site conditions. (Tr. 8/28/07, 170:2-171:2.)

85. The vent layer is the first layer placed on top of the pre-existing ground surface (or in some locations, on top of other contaminated materials placed by MACTEC that were to go "under the cap"), and consisted of a minimum six-inch thick layer of #67 stone that provides a continuous path for any gases emitted from the underlying burial ground to escape without damaging the cap. (Tr. 9/5/07, 72:6-21.)

86. Due to BJC's refusal to grant time extensions for unusually severe weather, MACTEC experienced problems placing the six inch vent layer underneath the cap. By design, the six inch stone vent layer was to be placed over the massive landfill area that was to be capped. The Project experienced unusually severe weather during the time period that MACTEC placed the vent layer, calendar years 2003 and 2004. (Tr. 9/5/07, 102:2-17.) This unusually severe weather required the placement of additional vent layer stone because the stone would sink into the sloppy mud and into the contaminated wood chips, thereby requiring MACTEC to place an additional 6 inches of clean stone on top of the already placed, but now contaminated stone. (Tr. 8/28/07, 26:1-17; Tr. 8/28/07, 131:24-132:13.) Because of BJC's acceleration directives MACTEC could not allow the site to dry out before proceeding with its work as planned. (Tr. 8/28/07, 130:21-131:1.) The unusually wet conditions also made the operation of equipment very difficult because the equipment would sink into the placed stone causing the stone to become contaminated by previously-spread wood chips and contaminated surface mud. *Id.* This caused the need to place additional vent stone. MACTEC placed more vent layer stone than it expected because of the unusually severe weather. (Tr. 8/28/07, 28:10-14.)

87. REA 69 seeks compensation for an additional 57,827.75 tons of vent stone used. The basis of the calculation is the difference between MACTEC's bid quantity of 36,016 tons for vent layer stone and the actual volume of 93,843.75 tons of stone. The increase in stone quantity is from 36,016 tons to 93,843 tons, an overrun of 160%. MACTEC used more than 2 ½ times the stone it would otherwise have used to construct the vent layer, due solely to these weather-related factors, all of which were encountered due to BJC's constructive acceleration. MACTEC paid \$9.85 per ton for the # 67 stone

used for the vent layer. Also included in the REA amount is the cost of equipment and labor used to place the stone. (Pl. Ex. 20P, Vol. 20; Tr. 8/28/07, 171:3-174:16.)

88. MACTEC's superintendent, Jim Bowman, testified that had the conditions been dry during the vent layer work, MACTEC would not have lost stone. (Tr. 8/28/07, 26:1-23, 27:2-28:25.)

89. Notably, BJC also overran its stone quantities on other SWSA projects while placing its vent layer. (Tr. 9/6/07, 119:2-15.)

90. Based on the evidence presented, I find that MACTEC is entitled to \$814,585.00, exclusive of interest, for REA 69. (Pl. Ex. 20P, Vol. 20.)

91. I find that MACTEC is entitled to interest beginning July 18, 2007, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20P, Vol. 20.)

92. I find that MACTEC is entitled to \$37,046.88 in prejudgment interest, computed at ten percent *per annum*, on the \$814,585.00 awarded for REA 69 for the time period commencing July 18, 2007 through December 31, 2007, and is entitled to interest at the daily amount of \$223.17 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 20P, Vol. 20.)

C. REA 71 – Dump Truck Weight Restrictions

93. MACTEC's REA 71 is based on BJC-imposed requirements that (1) the plastic wrapping in the back of MACTEC's dump trucks, referred to as "dirt burritos," which were filled with contaminated soil from the IHP not become unwrapped or split when they were dumped at the Environmental Management Waste Management Facility ("EMWMF")

and (2) MACTEC light loaded the trucks used to haul contaminated dirt to the EMWMF. (Tr. 8/28/07, 84:25-85:5.)

94. As part of its work, MACTEC had to dig and remove contaminated dirt from the IHP. The contaminated dirt was then transported to the local EMWMF disposal site using truck beds lined with plastic which overlapped the dirt. A tarp was placed over the liner. (Tr. 8/29/07, 6:19-7:1; Tr. 8/27/07, 208:11-209:20; Pl. Ex. 18-255, Vol. 19; Pl. Ex. 18-251, Vol. 19.)

95. It was determined in the pre-bid question and answer process that the decision of how the trucks were to be lined was to be left up to the subcontractor and not to be determined by BJC. MACTEC was able to bid the work using cost effective pricing for rolls of plastic liner instead of the more expensive prefabricated liners. (Tr. 8/27/07, 77:1-78:19, Pl. Ex. 3, Vol. 1, Q&A No. 19; Bates PX0003.0018.)

96. MACTEC's bid price was based upon its ability to determine how it would line the dump trucks used for waste disposal. (Tr. 8/27/07, 78:7-16.)

97. MACTEC used a plastic liner in the dump trucks hauling contaminated material from the IHP so the truck bed would not become contaminated during transit. The contaminated dirt in the truck bed was "burrito wrapped" so no material would escape the truck bed during transport. (Tr. 8/27/07, 210:16-211:3; Pl. Ex. 18, Vol. 7, photographs 250, 251, 252, 254, 255, 257.)

98. The tri-axle trucks MACTEC used to haul contaminated dirt to the disposal site have the capacity to hold 17 tons. (Tr. 8/27/07, 211:13-21; Pl. Ex. 20R8, Vol. 20.)

99. BJC imposed the restriction that the dirt burritos not split open when the trucks dumped their loads at the disposal site. (Tr. 8/28/07, 85:4-5; Tr. 8/27/07, 210:18-24, 212:8-20.) The dirt burritos were not designed to withstand the force of the weight from tons of dirt when dumped no matter what MACTEC could have done. (Tr. 8/27/07, 220:16-221:5.) As a result of the restriction, MACTEC had to put less and less dirt in the burrito wraps to try to keep them closed upon dumping. (Tr. 8/28/07, 85:4-5; Tr. 8/27/07, 210:18-24, 212:8-20.) MACTEC used different methods to seal the bags including duct tape, glue and heat guns. (Tr. 8/27/07, 208:11-19; Tr. 8/30/07, 7:2-17.) Regardless of how little material was in the bags or how the bags were sealed, the bags would split open at the disposal site when dumped. (Tr. 8/29/07, 7:2-17.)

100. BJC also imposed restrictions on the load limits of the MACTEC trucks hauling to the EMWMF. (Tr. 8/27/07, 214:5-215:3; Tr. 8/29/07, 7:18-8:6.)

101. Not only did BJC direct MACTEC to light load the trucks and make sure the "burrito wrap" did not split during dumping, but BJC constantly threatened to shut down the Project if MACTEC did not comply with BJC's directives. (Tr. 8/27/07, 215:10-216:10.)

102. Meanwhile, while placing these requirements on MACTEC, BJC was using its own forces to work in the Boneyard/Burnyard area. The trucks hauling contaminated material from the Boneyard/Burnyard to the disposal site were hauling material without sealed containers and without closing the top of the truck. "Boneyard/Burnyard was simply laying a piece of plastic down in the truck in order to keep contamination from getting in the welds of the [truck] bed." (Tr. 9/5/07, 82:16-83:6.)

103. MACTEC was not achieving 17 tons per truckload on the SWSA 4 Project because BJC's transportation person, Kim Leech, directed MACTEC to keep the tonnage to between 7-8 tons per load. (Tr. 8/27/07, 212:3-213:21; Pl. Ex. 20R11, Vol. 20.)

104. Leech would examine the back of the truck and if it looked like there was too much weight, she made MACTEC take it back to the IHP, dump and reload. (Tr. 8/27/07, 219:12-23.)

105. MACTEC was allowed to load heavier trucks once the IHP completion date drew nearer to meet a BJC milestone payment. (Tr. 8/27/07, 216:5-22.)

106. Had the restrictions not been placed on MACTEC, MACTEC would have been able to transport approximately 15 tons per load to the EMWMF. (Tr. 8/27/07, 22:7-14; Tr. 8/29/07, 10:3-11:8, 13:1-21; 34:24-36:5 Pl. Ex. 20R9 and 20R11, Vol. 20.) REA 71 calculations are based on the difference between the 15 tons and the actual average of 11 tons per load achieved with the restrictions. *Id.* Had MACTEC been permitted to haul 15 tons per load, it would have required 591.9 fewer loads to go to the EMWMF. *Id.* MACTEC's calculations include the price per load, the cost of the truck liners and the associated labor and equipment. *Id.*

107. BJC argues that MACTEC anticipated an average production of ten tons per truck, that MACTEC actually achieved an average of eleven tons and as such MACTEC actually exceeded its average estimated production. BJC's assertion is incorrect, as the trial testimony was to the contrary. Matt Foster testified that the anticipation of ten tons per truck "was what we [MACTEC] were anticipating in order to meet their [BJC's] requirement for no splitting at the other end, was the ten tons." (Tr. 8/29/07, 69:9-13) Foster clearly testified that MACTEC expected to average fifteen tons per truck, somewhat below the

seventeen tons per truck maximum, and that the ten tons per truck was the weight MACTEC was attempting to average under BJC's mandate that the dirt burritos not split during dumping. (Tr. 8/27/07, 222:7-14; Tr. 8/29/07, 10:3-11:8,13:1-21,34:24-36:5; Pl. Ex. 20R9 and 20R11, Vol. 20). Thus, BJC's contention that ten tons per truck was MACTEC's anticipated per truck haul load is contrary to the evidence.

108. MACTEC was damaged by BJC's directives to light load the trucks so the burrito wraps would not split upon dumping. (Pl. Ex. 20R, Vol. 20.)

109. Based on the foregoing, I find that MACTEC is entitled to \$475,786.29, exclusive of interest, for REA 71. (Pl. Ex. 20R, Vol. 20.)

110. I find that MACTEC is entitled to interest beginning July 18, 2007, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20R, Vol. 20.)

111. I find that MACTEC is entitled to \$21,638.50 in prejudgment interest, computed at ten percent *per annum*, on the \$475,786.29 awarded for REA 71 for the time period commencing July 18, 2007 through December 31, 2007, and is entitled to interest at the daily amount of \$130.35 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 20R, Vol. 20.)

D. REA 54 – Haul Road Restrictions

112. By Subcontract, MACTEC's scope of work included "design[ing] and construct[ing] haul road(s) from the borrow facility to SWSA4, tying into existing haul roads where feasible." (D. Ex. 1 at 52677, Ex. D, § 2.3.9.)

113. As designed and constructed by MACTEC, the haul road from the borrow pit to SWSA 4 was "around three miles" in length. (Tr. 8/27/07, 155:7-10.)

Approximately 1.6 miles of the haul road was one-way, incorporating three or four “turnouts” along the way, “to allow one truck to pull over and another truck to go past.” (Tr. 9/5/07, 45:21-47:5.) In other words, the road was not wide enough to allow two dump trucks going in opposite directions to pass. As designed and constructed by MACTEC, the entire haul road was subject to a 15 mph, or lower, posted speed limit. (Tr. 9/5/07, 47:13-18.) Additionally, two stop signs and a sharp, 120° degree turn caused all truck traffic to stop, or greatly slow, at these points. (Tr. 9/5/07, 47:5-12.)

114. In 2003, BJC widened this 1.6 mile length of the haul road to forty feet. This enabled that section of haul road to accommodate two-way traffic, heavier trucks, and higher speeds. (Tr. 9/5/07, 47:25-48:13.) The posted speed limit was raised to 30 mph. (Tr. 9/5/07, 48:5-7.) The stop signs and the sharp turn also were eliminated. (Tr. 9/5/07, 48:13-19.)

115. On June 10, 2004, on another portion of the haul road, there was a roll-over accident involving another subcontractor. Before the accident, that portion of the haul road was eighteen feet wide, not wide enough for two trucks to safely pass one another: “there [was] absolutely no shoulder... it literally drop[ped] straight off into White Oak Creek.” (Tr. 9/5/07, 45:1-20.)

116. A portion of the haul road “slightly less than 200 yards” in length, was narrowed following this event. BJC “installed Jersey barriers [along the side of the 200-foot section]... and the road width was cut to fifteen feet.” (Tr. 9/5/07, 45:3-5.) BJC posted flaggers, with a clear line of sight from one to the other, at each end of the narrowed section of the haul road. (9/5/07 Tr. at 45:5-8.)

117. As a result of the narrowing of this 200-yard stretch of the haul road, traffic approaching from one direction often (about “two-thirds of the time”), but not always, was halted by a flagger to allow traffic from the opposite direction to proceed. (Tr. 9/5/07, 49:16-19.) Right of way was given to heavy equipment, like dump trucks, “to keep the work moving.” (Tr. 9/5/07, 49:18-19.) When halted by the flaggers for this purpose, it was for “a couple of minutes at most.” (Tr. 9/5/07, 49:20-22.)

118. By July 7, 2004 letter, MACTEC first notified BJC of REA 54, seeking costs “in connection with the recently adopted safety restrictions on the SWSA 4 haul road.” (P. Ex. 363.) This notification came 27 days after the accident when the restriction was imposed. MACTEC asserted that “[o]ver the course of a nine-hour day, each truck is losing two hours of productivity” due to the restriction. (P. Ex. 363.)

119. By December 3, 2004 letter to BJC, MACTEC first presented its claim for REA 54, requesting \$426,400 in costs plus a schedule extension of 15.5 working days, as a result of the “impact from mandated one-way traffic on haul road.” (D. Ex. 149.)

120. By REA 54, MACTEC claimed “production delays” due to the haul road restriction began June 12, 2004, and lasted through August 17, 2004. (D. Ex. 149.)

121. The cost breakdown enclosed with MACTEC’s December 3, 2004 notice of REA 54 asserted costs for labor and management personnel, plus equipment—each for 141.18 hours—due to “lost labor (craft and foreman) and equipment utilization (52%)” and “lost time involved with this delay of activities.” (D. Ex. 149.)

122. The amounts claimed by MACTEC with respect to REA 54 are the product of the analysis contained in the “calculation sheet” that is the last page of REA 54

as submitted by MACTEC on December 3, 2004, and particularly the 2213 "lost loads" as shown on that calculation sheet. (D. Ex. 149 at 109272; Tr. 8/29/07, 188:15-18.)

123. The calculation seeks to calculate the number of loads per truck per day that would have been realized but for the haul road restriction. (Tr. 8/29/07, 188:19-189:4.) The calculated number of truck loads per day that "would have been realized" is based on the assumption that a 40-minute cycle time per load would be achieved, but for the haul road restriction. (Tr. 8/29/07, 190:21-23.)

124. The calculation sheet reveals that MACTEC's "actual loads per truck" achieved during this period varied quite substantially, from lows of 1.69 (on June 12), 1.75 (July 14), and 2.0 (August 3 and August 5) average loads per day to 9.13 (July 15), 9.5 (July 13), 10.60 (June 18) and 10.63 (July 16) load per day on other days. (D. Ex. 149 at 109272.) According to Matt Foster, MACTEC's claim calculation assumed that this substantial variation was "due solely to having a flagger in the 200-yard stretch" of the haul road. (Tr. 8/29/07, 195:11-16.) Foster agreed that REA 54 was based on the assumption that "there were no other influences affecting the round trip time and how many loads per day a truck was able to carry." (Tr. 8/29/07, 190: 2-11.) If there were problems at the borrow area loading the trucks, or problems at the cap unloading the trucks, or any other reasons for delay unrelated to the safety restrictions, MACTEC did not account for them in its REA 54 calculation. (Tr. 8/29/07, 190:12-20.)

125. REA 54 also did not account for any trucking delays due to inclement weather, even though June-July 2004 storms formed the basis for MACTEC's REA 52, also submitted December 3, 2004. (P. Ex. 2015 at 014225 (indicating at least six days claimed as rain days on which MACTEC alleges only the haul road restriction affected production.)

126. On August 3, 2004, when a group of six dump trucks worked 10 hours but managed on average only two round trips (5 hours per trip), MACTEC's contention, according to Foster, was that each of the those six trucks sat waiting for the flagger an average of two hours and ten minutes in each direction on each trip (4 hours, 20 minutes of waiting time per round trip). (Tr. 8/29/07,191:3-192:18.)

127. Foster had no explanation for how the impact of the flaggers and Jersey barriers on the very next day (August 4) could have changed so dramatically as to reduce the average cycle time from five hours round-trip to 1.5 hours round trip. (Tr. 8/29/07,193:6-20.) It can be inferred from such dramatic changes that other factors (such as weather or problems at either the loading or unloading end) were actually the predominant elements affecting the cycle time, not the flaggers and Jersey barriers.

128. Even on the most productive day (July 16), MACTEC claims that each of its trucks spent at least 15 to 16 minutes per round trip waiting to get past the one-way stretch. (Tr. 8/29/07,194:5-24.) MACTEC's Project Engineer Mark Cade testified that "the longest period of time that [he] experienced waiting on the flag men" was "fifteen, twenty minutes." (Tr. 8/30/07, 85:1-4.) In contrast, Robert Spurling testified that any delay was far less ("a couple of minutes at most"). Spurling traveled through that area on average three times per day. (Tr. 9/5/07, 49:2-22.)

129. Overall, MACTEC's claim is that "on average... the round trip time over [the] entire period [June 12, 2004 through August 17, 2004] had more than doubled and the efficiency dropped more than fifty percent," solely due to the presence of the restrictions affecting a 200-yard stretch of a three-mile haul road. (Tr. 8/29/07,195:11-16.) This assertion simply is not supported by the evidence presented.

130. MACTEC has not provided any reliable evidence as to the validity of any amounts claimed in REA 54.

131. MACTEC did not substantiate the existence of any added costs or schedule delays as claimed in REA 54 resulting from the addition of Jersey barriers and flaggers along a 200-yard section of the haul road. In the final analysis, the claim submitted for \$426,000 is not substantiated by credible evidence. To the extent that there were any delays or added costs, the evidence substantiates that they were very minor.

132. Based on the foregoing, MACTEC is not entitled to any amount, or to any schedule extension, for REA 54.

E. REA 52 – Storm Damage

133. MACTEC experienced external impacts beyond its control that extended its cap work duration. (Tr. 8/28/07, 186:9-18.) MACTEC encountered severe storm events in June and July 2004 which resulted in damage to the cap. (Tr. 8/28/07, 186:14-18.)

134. But for these external impact delays, MACTEC's cap work would have been completed prior to the June-July 2004 timeframe, and the cap would not have been subjected to the weather that damaged it and required MACTEC to make the repairs. (Tr. 8/28/07, 186:9-18.)

135. Photographs taken June 18 and June 22, 2004 depict damage to the cap as a result of the storms. (Tr. 8/28/07, 186:19-193: 7; Pl. Ex. 20G2, Vol.19 pp. 21, 22, 24, 31, 33, 36, 41, 43, 45, 46, 50, 53, 54, 55, 56, 82.)

136. On July 19, 2004, MACTEC provided notice to BJC that a REA would be prepared in connection with the extensive storm related damage sustained at the SWSA 4 cap. (Pl. Ex. 366, Vol. 35.)

137. On December 3, 2004, MACTEC submitted REA 52 requesting \$116,700 and schedule relief of 15 working days associated with the extensive damage to the SWSA 4 cap due to severe weather during the June-July 2004 timeframe. (Pl. Ex. 20G, Vol. 19.) The calculations for REA 52 include cost incurred by MACTEC's subcontractor for liner repair, trucking cost for hauling in suitable material, labor and equipment costs. (Pl. Ex. 20G, Vol. 19; Tr. 8/28/07, 193:8-194: 1.)

138. BJC's Melton Valley Project Manager, Robert Spurling testified that the adverse weather and June-July 2004 storm events were clearly an impact. Ultimately, BJC agreed it was an impact and granted the 15 day schedule relief requested. (Tr. 9/5/07, 68:7-11.) On April 27, 2005, after MACTEC's work was essentially complete, BJC responded to MACTEC's REA by granting the 15 day extension, but denying the request for reimbursement of costs incurred by MACTEC to repair the cap damage. (Pl. Ex. 20E7, Vol. 19.)

139. BJC contends that MACTEC is not entitled to recover delay damages because the Subcontract contains Special Condition SC-20 which provides that a time extension is the sole remedy for delay.

140. During the course of the project, BJC wholly ignored SC-20. MACTEC previously submitted REA 25 (HAD Delay), REA 26 (EMWMF Delay), REA 27 (EMWMF Delay), REA 29 (EMWMF Delay), REA 31 (EMWMF Delay) and REA 32 (EMWMF Delay) all of which sought pure delay damages. (Tr. 8/30/07, 32:10 – 34:10; Pl. Ex. 4, Vol. 1, Tab

30, PX0004.0278-0279.) All of these pure delay REAs were entertained, negotiated and paid by BJC during the course of the Project. *Id.*

141. I find that BJC's payments for delay damages were in contravention to its position interpreting the "no damage for delay" clause set forth in the Subcontract. I further find that BJC waived the defense of "no damages for delay" through its consistent course of conduct.

142. Based on the foregoing, I find that MACTEC is entitled to \$92,432.80, exclusive of interest, for REA 52. (Pl. Ex. 20G, Vol. 19.)

143. I find that MACTEC is entitled to interest beginning December 3, 2004, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20G, Vol. 19.)

144. I find that MACTEC is entitled to \$28,464.24 in prejudgment interest, computed at ten percent *per annum*, on the \$92,432.80 awarded for REA 52 for the time period commencing December 3, 2004 through December 31, 2007, and is entitled to interest at the daily amount of \$25.32 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 20G, Vol. 19.)

F. REA 73 – UGT Excavation

145. MACTEC was required by the Subcontract to remediate (de-contaminate) the area outside the cap in the vicinity of the Upgradient Diversion Trench ("UGT"). MACTEC dug out the contaminated soil. The area was no longer a radiologically contaminated ("RAD") area and had been signed off as complete. (Tr. 8/28/07, 165:2-23.)

146. During the pre-bid process, BJC was asked if equipment becomes contaminated and cannot be decontaminated after a reasonable effort to decontaminate,

would BJC purchase the equipment at a fair market price. (Pl. Ex. 3, Vol. 1, Q&A No. 80, Bates PX0003.0048.) BJC referred the bidders to Special Condition 12 which provides:

Subcontractor shall take all reasonable measures to mitigate the potential for contamination of its equipment during performance of the Work. If Contractor determines that required exit decontamination limits, as set forth in the Subcontract documents, of any piece of equipment is unattainable, despite Subcontractor best efforts, Subcontractor will be compensated for the appraised value of the equipment considering age, condition, and value of similar equipment, unless contamination of said equipment is deemed by the Contractor to be the result of carelessness or negligence on the part of the Subcontractor.

(Tr. 8/27/07, 82:22-83:12; Pl. Ex. 57, Vol. 24, SC-12.)

147. BJC's Melton Valley Project Manager, Robert Spurling testified that MACTEC remediated the area as required by the ROD to a maximum of two feet as required by the Subcontract. MACTEC actually over dug a little to establish the grades they needed. (Tr. 9/5/07, 86:19-87:5.)

148. After the area was decontaminated and signed off as complete, BJC directed MACTEC to dig out the dirt with a backhoe along the alignment of the UGT, check the dirt for contamination, then replace the dirt in advance of the large continuous trencher equipment performing in the area. (Tr. 8/28/07, 166:14-19.) BJC directed MACTEC to pre-dig the soil although MACTEC had previously completed remediation in this area in accordance with the Subcontract. (Pl. Ex. 11N, Vol. 4, Bates MACTEC SWSA 075777; Pl. Ex. 11O, Vol. 4, Bates BJC SWSA4-71588; Pl. Ex. 11P, Vol. 4, Bates BJC SWSA4-71548; Pl. Ex. 11Q, Vol. 4, Bates MACTEC SWSA 075748.)

149. The costs for REA 73 are the costs to perform the excavation in advance of the continuous trencher. (Pl. Ex. 20S, Vol. 20; Tr. 8/28/07, 166:14-21.)

150. MACTEC performed the BJC directed work in this area from January 12, 2004 through January 17, 2004. (Pl. Ex. 11AJ, Vol. 4; Pl. Ex. 16 – daily reports dated January 12, 2004, January 13, 2004, January 16, 2004 and January 17, 2004, Vols. 12-15; Tr. 8/28/07, 167:13-169:22.)

151. MACTEC incurred additional expenses as a result of BJC's directive to excavate and re-check the soil along the UGT. (Pl. Ex. 20S, Vol. 20.)

152. Based on the foregoing, I find that MACTEC is entitled to \$26,371.62, exclusive of interest, for REA 73. (Pl. Ex. 20S, Vol. 20.)

153. I find that MACTEC is entitled to interest beginning July 18, 2007, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20S, Vol. 20.)

154. I find that MACTEC is entitled to \$1,199.37 in prejudgment interest, computed at ten percent *per annum*, on the \$26,371.62 awarded for REA 73 for the time period commencing July 18, 2007 through December 31, 2007, and is entitled to interest at the daily amount of \$7.23 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 20S, Vol. 20.)

G. REA 51 – Contaminated Water

155. MACTEC's Subcontract Scope of Work included cutting and capping of a six inch liquid low level waste ("LLLW") line. (Pl. Ex. 20F, Vol. 19.)

156. MACTEC encountered more water than expected in the LLLW line. MACTEC drained and collected the contaminated water. (Tr. 8/28/07, 181:3-182:2.) Because of a contamination incident with another BJC subcontractor, MACTEC was not

permitted to return to the site for a period of time. *Id.* During that period of time, there was a rain event that mixed rainwater with the water drained from the LLLW line. *Id.*

157. BJC did not have RAD technicians available to support the spill. (Tr. 9/5/07, 38:11-17.)

158. BJC required MACTEC to have the LLLW water sampled to meet the waste storage requirements due to the presence of the VOC contaminant Toluene. (Pl. Ex. 20F3, Vol. 19.)

159. Neither the contract documents nor any BJC representative on site quantified the amount of potential water coming from this particular line. At best, there was only the possibility of some water in the LLLW. (Pl. Ex. 4, Vol. 1, Q&A Nos. 95 and 99.)

160. On June 25, 2004, notice was provided to BJC that MACTEC was preparing a REA in connection with the disposition of the contaminated water including both rainwater and water drained from the six-inch LLLW line. (Pl. Ex. 20F05, Vol. 19)

161. On December 3, 2004, MACTEC submitted to BJC a REA in the amount of \$71,100.00 to recover costs associated with the disposition of the contaminated water including both rainwater and water drained from the six inch LLLW line. (Pl. Ex. 20F, Vol. 19)

162. REA 51 includes the cost expended for disposition of the contaminated water and rainwater resulting from the lack of RAD technicians which includes payment to MACTEC's subcontractors MDM Sampling and NFT Laboratory for water sampling and laboratory analysis. (Pl. Ex. 20F and 20F10, Vol. 19; Tr. 8/28/07, 181:3-5, 182:20-185:5.)

163. Based on the foregoing, I find that MACTEC is entitled to \$64,551.52, exclusive of interest, for REA 51. (Pl. Ex. 20F, Vol. 19.)

164. I find that MACTEC is entitled to interest beginning December 3, 2004, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20F, Vol. 19.)

165. I find that MACTEC is entitled to \$19,878.33 in prejudgment interest, computed at ten percent *per annum*, on the \$64,551.52 awarded for REA 51 for the time period commencing December 3, 2004 through December 31, 2007, and is entitled to interest at the daily amount of \$17.69 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 20F, Vol. 19.)

H. REA 56 – Pipe Abandonment

166. MACTEC's Scope of Work required it to cut and cap certain LLLW lines. (Pl. Ex. 57, Vol. 24, Bates PX0057.0074.) MACTEC obtained a penetration permit from BJC that contained inaccurate information regarding the location of those buried LLLW lines. (Tr. 8/28/07, 179:2-20.)

167. MACTEC cut and plugged the wrong LLLW lines because of the inaccurate penetration permit. *Id.*

168. On December 3, 2004, MACTEC submitted a written REA with supporting documentation to BJC. (Pl. Ex. 20K, Vol. 19.)

169. In an August 3, 2005 draft letter, BJC conceded that REA 56 had merit, but disagreed with the charges for "cost of capital" and "additional bonding" and offered to settle the REA for \$8,343. (Pl. Ex. 20E9, Vol. 19.)

170. I find that MACTEC is entitled to \$9,276.32, exclusive of interest, for REA 56. (Pl. Ex. 20K, Vol. 19.)

171. I find that MACTEC is entitled to interest beginning December 3, 2004, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20K, Vol. 19.)

172. I find that MACTEC is entitled to \$2,856.00 in prejudgment interest, computed at ten percent *per annum*, on the \$9,276.32 awarded for REA 56 for the time period commencing December 3, 2004 through December 31, 2007, and is entitled to interest at the daily amount of \$2.54 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 20K, Vol. 19.)

I. REA 57 – Piezometer Installation

173. BJC's safety authorization basis documents provided that the subcontractor could not excavate within the limits of waste. (Tr. 8/27/07, 75:10-25; Pl. Ex. 3, Vol. 1, Q&A No. 25 Bates PX0003.0039.) BJC instructed the bidders that it would be the subcontractor's responsibility to determine the limits of waste. *Id.*

174. BJC informed the bidders that it could not do any grading in the limits of waste areas, which were not established prior to bidding, and that there could also be no excavation or penetration of the soil due to concerns that there may be fissile material contained in that location. (Tr. 8/27/07, 79:1-20; Pl. Ex. 3, Vol. 1, Q&A Nos. 3 and 25 Bates PX0003.0036 and 0039.)

175. Before bidding, MACTEC was allowed to visit the site, but was not allowed to do any site investigations. (Tr. 8/27/07, 70: 4-8.) MACTEC was not allowed to walk onto the existing dirt cap, was not allowed to dig in the existing dirt, was not allowed to come into contact with any of the dirt or vegetation on either side of the road, and was only allowed to stay on the gravel road during its site visit. (Tr. 8/27/07, 71:1-12.)

176. MACTEC's work included installing piezometers to measure water levels. There was a total of 21 piezometers to be installed, three in the downgradient trench, eleven in the limits of waste or cap area and seven to be installed outside the limits of waste or off-cap. (Tr. 8/27/07, 116:7-20; Pl. Ex. 20L, Vol. 20; Tr. 8/29/07, 13:22-14:11.)

177. Because the safety basis documents provide that no material from under the cap can be brought back to the surface. The only way to install piezometers and not bring material back to the surface is via the direct push method. (Tr. 8/29/07, 15:22-16:25.)

178. MACTEC was not successful in installing any piezometers on the cap or off the cap via the direct push method, which is the only method compatible with the safety basis documents. (Tr. 8/29/07, 17:1-25.) MACTEC developed a different method for off cap piezometer installation and developed a safety basis document for the installation which was approved by BJC. (Tr. 8/29/07, 16:17-17:25.) MACTEC never installed the eleven piezometers within the limits of waste area but was in the process of getting the required safety basis approval. MACTEC requests reimbursement of the costs paid to their subcontractor, Miller Government Services, for the failed attempts and the difference in costs for the actual installation of the seven piezometers installed off the cap area using the alternate approved method. (Tr. 8/29/07, 19:1-18.)

179. The costs of MACTEC's failed installation effort is \$61,054.14, and the cost to install the seven off cap piezometers is \$65,036.84. (Pl. Ex. 20L, Vol. 20)

180. Based on the foregoing, I find that MACTEC is entitled to \$126,090.98, exclusive of interest, for REA 57. (Pl. Ex. 20L, Vol. 20.)

181. I find that MACTEC is entitled to interest beginning July 27, 2007, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20L, Vol. 20.)

182. I find that MACTEC is entitled to \$5,389.09 in prejudgment interest, computed at ten percent *per annum*, on the \$126,090.98 awarded for REA 57 for the time period commencing July 27, 2007 through December 31, 2007, and is entitled to interest at the daily amount of \$34.55 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 20L, Vol. 20.)

J. REA 59 – Change in Grass Seed Mixture

183. The Subcontract specified a seed mixture to be placed on the SWSA 4 cap. (Pl. Ex. 20M, Vol. 20; Pl. Ex. 20M1, Vol. 20.)

184. BJC directed a change in the seed mixture. REA 59 is a claim for the cost involved in changing the seeding mixture. Much of the costs involved relate to BJC stopping MACTEC's work and MACTEC having to wait for the revised seed mixture issue to be resolved. (Tr. 8/28/07, 201:5-14.)

185. Field Change Modification Request 119 dated October 5, 2004 indicates MACTEC was ready to commence hydroseeding activities on August 19, 2004 when BJC directed a change in the seed mix. Due to delays in obtaining the seed mixture and intervening weather impacts, hydroseeding did not start until September 11, 2004, a delay of 11 scheduled work days. (Tr. 8/28/07, 201:15-202:13; Pl. Ex. 20M7, Vol. 20.) The cap seeding activity was on the critical path. (Tr. 8/31/07, 40:6-20.)

186. MACTEC paid \$13,196.09 for the new seed mixture. (Tr. 8/28/07, 202:14-25; Pl. Ex. 12A, Vol. 4; Pl. Ex. 20M, Vol. 20.)

187. On September 15, 2004, BJC was given notice that MACTEC was preparing a REA to recover the cost and schedule impacts resulting from the delayed decision by BJC to direct a change in the grass seed mixture. (Pl. Ex. 20M6, Vol. 20.)

188. On December 3, 2004, MACTEC requested an equitable adjustment of \$45,600 to recover the costs associated with BJC's directed seed mixture change. As set forth in MACTEC's REA, BJC's verbal direction to delay the seeding activity and direct a new seed mixture after the approved mixture was procured and delivered adversely impacted MACTEC's completion schedule and cost of performance. BJC's delay in directing a change to the approved grass seed mixture resulted in additional costs for engineering, labor, equipment, and reprocurement of seed. (Pl. Ex. 20M, Vol. 20; Tr. 8/28/07, 201:5-14.)

189. Over four months later, BJC responded to REA 59 indicating that BJC's direction with regard to this REA had no impact on any incremental costs to MACTEC, with the exception of the warm grass seed mixture. BJC requested evidence of MACTEC's expenditure for the seed (e.g., invoice, purchase order) in exchange for payment in the amount of \$13,196.00. (Pl. Ex. 20E7, Vol. 19.)

190. Based on the foregoing, I find that MACTEC is entitled to \$44,526.00, exclusive of interest, for REA 59. (Pl. Ex. 20M, Vol. 20.)

191. I find that MACTEC is entitled to interest beginning December 3, 2004, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20M, Vol. 20.)

192. I find that MACTEC is entitled to \$13,711.57 in prejudgment interest, computed at ten percent *per annum*, on the \$44,526.00 awarded for REA 59 for the time period commencing December 3, 2004 through December 31, 2007, and is entitled to

interest at the daily amount of \$12.20 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 20M, Vol. 20.)

K. REA 55 – CLA Violation

193. By the terms of Subcontract Special Condition SC-19, MACTEC agreed to “comply with the provisions of any labor agreement(s) that apply to the Work performed under th[e] Subcontract as specified in Exhibit J [Wage Determination].” (D. Ex. 1 at 52609, Ex. B, SC-19.)

194. Exhibit J to the Subcontract is the Construction Labor Agreement (CLA), entered into on October 1, 1997 and subsequently revised, by and between the “signatory employers” and the “signatory unions” performing work on all of the Department of Energy sites in Oak Ridge, Tennessee. (D. Ex. 1 at 52878-80, Ex. J.)

195. MACTEC is a “signatory employer” to the CLA. (Tr. 8/29/07, 150:22-24.)

196. By July 22, 2004 letter, MACTEC first notified BJC of REA 55, seeking costs “in connection with the temporary loss of two operators at the SWSA 4 site.” (P. Ex. 20J4.)

197. By December 3, 2004 letter to BJC, MACTEC first presented its claim for REA 55, in the amount of \$17,900, for “impact due to BJC subcontractor and Operating Engineers Local 818 CLA violation.” (D. Ex. 154; Tr. 8/29/07, 149:18-20.)

198. MACTEC contends that BJC is liable for the acts of the operators’ union and/or another BJC subcontractor because BJC also is signatory to the CLA—as is every contractor that works at Oak Ridge (Tr. 8/29/07, 151:2-4)—and because BJC “declined” to refer a like incident to the Union Management Administrator. MACTEC references no

evidence of record of such prior incident, or how BJC is alleged to have assumed some extra-contractual responsibility.

199. MACTEC's Matthew Foster admitted that he "kn[e]w of no contractual requirement" for BJC to take on the duty of representing MACTEC with respect to the operating engineers' union under the CLA. (Tr. 8/29/07, 153:15-20.) If MACTEC had a grievance against the Operating Engineers Union, as a "signatory employer" under the CLA, MACTEC was entitled to raise the grievance itself under the terms of the CLA. (D. Ex. 1 at 52878-80, Ex. J.)

200. MACTEC is not entitled to any recovery against BJC of costs incurred as a result of other parties' alleged violation of the CLA. There is no contractual basis on which to conclude that BJC was responsible to act on MACTEC's behalf with regard to others' alleged violation of the CLA, and no evidence that BJC breached any obligation owed to MACTEC under the Subcontract.

201. Accordingly, MACTEC is not entitled to any amount for REA 55.

L. REA 50 – Spill Supplies

202. On June 10, 2004, Sevenson, BJC's subcontractor on the SWSA 5 project had an accident involving a forklift on the haul road near White Oak Creek. (Pl. Ex. 20E1, Vol. 19; Tr. 8/28/07, 175:13-176:5.)

203. MACTEC supplied spill response materials at BJC's request to assist in clean up after the accident. (Tr. 8/28/07, 174:17-25.)

204. On December 3, 2004, MACTEC submitted to BJC a REA to recover costs associated with the supplies MACTEC provided in response to the June 10, 2004 forklift rollover and spill incident at SWSA 5. (Pl. Ex. 20E, Vol. 19)

205. Included in MACTEC's REA 50 are calculations for the cost of materials supplied by Lynx Supply, the cost of the forklift used to deliver the materials, off-load and replenish MACTEC's supplies, and the cost of the personnel involved in the effort. (Tr. 8/28/2007, 176:8-25; Pl. Ex. 20E, Vol. 19.)

206. REA 50 includes the cost of materials, equipment and labor hours expended by MACTEC in the amount of \$8,900.00 (Pl. Ex. 20E, Vol. 19.)

207. On April 27, 2005, BJC indicated by letter to MACTEC that "BJC would certainly want to reimburse MACTEC for its assistance in this situation. However, we have a very limited recollection of MACTEC's participation in this incident. Please provide details with respect to the specifics of MACTEC's assistance. Also, any documentation of the event, such as the Job Superintendent's log entry, would be helpful." (Pl. Ex. 20E07, Vol. 19.)

208. In an August 3, 2005 letter, BJC offered to pay the \$8,900.00 requested for REA No. 50 provided MACTEC submits to BJC copies of Lynx invoices numbered 28236, 28475 and 28900. (Pl. Ex. 20E 09, Vol. 19.)

209. MACTEC's Daily log documenting the accident and subsequent assistance request from BJC is located at Pl. Ex. 20E 01. Lynx Supply invoices requested by BJC are located at pages 3-5 of Pl. Ex. 20E04.

210. BJC admits that REA 50 has merit. (Pl. Ex. 563, Vol. 41, Bates BJCSWSA4-112259.)

211. Based on the foregoing, I find that MACTEC is entitled to \$8,498.54, exclusive of interest, for REA 50. (Pl. Ex. 20E, Vol. 19.)

212. I find that MACTEC is entitled to interest beginning December 3, 2004, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20E, Vol. 19.)

213. I find that MACTEC is entitled to \$2,617.08 in prejudgment interest, computed at ten percent *per annum*, on the \$8,498.54 awarded for REA 50 for the time period commencing December 3, 2004 through December 31, 2007, and is entitled to interest at the daily amount of \$2.33 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 20E, Vol. 19.)

M. REA 60 – Wetlands Restoration

214. The Subcontract required MACTEC to accomplish prescribed tasks associated with the Wetlands Restoration: (1) hire a wetlands specialist to draft a detailed wetlands design, (2) build a berm around the wetlands area, (3) excavate the wetlands and dispose of the contaminated soil at the local disposal site, (4) design the new wetlands to be constructed, (5) install a V-notch weir to control water, line with riprap where the upgradient water would spill into the wetlands area, and (6) plant wetland seed and trees. (Tr. 8/27/07, 99:16-100:21; Pl. Ex. 57, Vol. 24, Bates PX0057.0077.)

215. REA 60 is a credit to BJC for the deleted portions of the wetlands restoration. (Tr. 8/28/07, 208:1-8; Pl. Ex. 20N, Vol. 20.)

216. Subcontract Change Notice (“SCN”) 38 provides that MACTEC shall not be required to provide restoration or planting of trees, installation of drainage ways, or

wetland seed mix along the drainage ways within the IHP wetlands area. (Pl. Ex. 20N, Vol. 20, Bates BJC SWSA4-60223.)

217. MACTEC performed the following work in the wetlands restoration area: removal of the sedimentation drainage structure, installation of the V-notch weir, clean out of the sediments that had accumulated in the wetlands area, riprap of pipes that exited in the wetlands area and purchasing of trees for the wetlands. (Tr. 8/27/07, 198:23-25; Tr. 8/28/07, 208:9-209:13.)

218. Developing the wetlands work instruction and preparing the wetlands specification was also part of the wetlands pay item which MACTEC completed. (Tr. 8/28/07, 210:6-211:8; Pl. Ex. 20N12, Vol. 20; Pl. Ex. 20N11, Vol. 20.)

219. As part of the Wetlands Scope of Work, MACTEC hired a wetlands specialist to determine a detailed design on how the wetlands would be constructed. (Pl. Ex. 57, Vol. 24, Exhibit D, Section 2.3.12.) Also, MACTEC constructed a berm to hold water. MACTEC installed a V-notch weir control structure to operate as an overflow to create a ponding action in the wetlands. MACTEC also lined the upgradient culvert with riprap to prevent erosion where the water spilled out into the holding pond. (Tr. 8/27/07, 99:16-100:18.) MACTEC's crew performed clearing and grubbing in the wetlands area. (Tr. 8/27/07, 197:17-25.)

220. According to comments found in MACTEC's schedule, on 03/08/04 MACTEC recorded the wetlands progress by stating "seed and tree suppliers have been contacted. Additional rye grass may be added to wetlands meadow mix to allow seeding as currently scheduled. The trees will be put in cold storage to allow planting in early

summer." (Pl. Ex. 11V, Bates MACTEC SWSA 075568-9; Pl. Ex. 11W, Bates MACTEC SWSA 075547; Pl. Ex. 11X, Bates MACTEC SWSA 075521.)

221. Based on the foregoing, I find that MACTEC is entitled to \$21,304.92, exclusive of interest, for REA 60. (Pl. Ex. 20N, Vol. 20.)

222. I find that MACTEC is entitled to interest beginning December 3, 2004, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20N, Vol. 20.)

223. I find that MACTEC is entitled to \$6,560.75 in prejudgment interest, computed at ten percent *per annum*, on the \$21,304.92 awarded for REA 60 for the time period commencing December 3, 2004 through December 31, 2007, and is entitled to interest at the daily amount of \$5.84 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 20N, Vol. 20.)

N. REA 53 – Delete Guard Shack

224. Subcontractor Change Notice (SCN) 39 deleted from MACTEC's scope of work the security building located at the badge reader operated gate at Post 24. (Pl. Ex. 19, Vol. 18, Tab 39, Bates PX0019.00221.)

225. BJC also directed MACTEC to install a bar gate at Post 24 instead of the electric gate specified on the contract drawings. (Tr. 8/28/07, 204:16-19.)

226. MACTEC issued a deductive credit to subcontractor Tellico in the amount of \$2,506.09 for running the electricity to the guard shack (security building). The credit for the electrical subcontractor is included in the REA 53 calculation. (Tr. 8/28/07, Foster 205:1-206:1; Pl. Ex. 20H, Vol. 19.)

227. Included in the REA calculation is a credit of <\$7,289.77> for the guard shack building which includes <\$4,500> for an eight by eight guard shack, <\$1,100> for an air conditioner and shipping fees. (Tr. 8/28/07, 206: 7- 20; Pl. Ex. 20H, Vol. 19.)

228. Included in the REA are additional costs associated with the bar gate which BJC directed MACTEC to install at Post 24. REA is a net credit of <\$2,400.00> for deleting the guard shack and adding the bar gate. (Tr. 8/28/07, 207: 2-16; Pl. Ex. 20H, Vol. 19.)

229. BJC offered MACTEC a credit of <\$8,122.00>. (Tr. 9/5/07, 20: 3-9; Pl. Ex. 20E7, Vol. 19.) However, BJC's offer did not take into account the cost of adding the bar gate.

230. I find that BJC is entitled to a credit of <\$2,400> for costs associated with REA 53.

O. REA 63 – Weir Construction In Radiation Area

231. Water collected in the DGT was to be treated in the WTF and the clean water was then to be released into the IHP. The purpose of the V-notch weir was to allow clean water from the IHP to overflow into White Oak Creek. (Tr. 8/27/07, 55:14-19.)

232. REA 63 is a claim for the additional costs associated with installing the V-notch weir in what BJC contended was a radiologically contaminated area rather than a clean area as planned. (Tr. 8/28/07, 199:1-4.)

233. MACTEC was to take out the existing sediment drainage structure and replace it with a V-notch weir. MACTEC filled the gap in the berm area with clean fill before installing the weir. After the clean fill was placed, but prior to the weir construction, BJC

posted the area as a RAD area. MACTEC was then required to install the weir pursuant to RAD work requirements. (Tr. 8/28/07, 199:13-200:10.)

234. Robert Spurling agreed that when MACTEC installed the temporary berm, they placed clean fill for the berm. (Tr. 9/5/07, 54:3-5.)

235. Spurling testified that MACTEC remediated the IHP to a level established by the ROD. (Tr. 9/5/07, 58:21-25.)

236. Working in a RAD area is less efficient than a non-RAD area because of the safety restrictions and the limited ability to pass materials and tools in and out of the area. (Tr. 8/28/2007, 200:5-10.)

237. On November 5, 2004, MACTEC provided BJC notice of its intent to recover the cost and schedule impact resulting from the unexpected RAD work in the area designated for construction of the weir system. (Pl. Ex. 20O5, Vol. 20.)

238. On December 3, 2004, MACTEC submitted REA 63 in the amount of \$94,800, requesting reimbursement for costs of equipment and labor to perform the work under RAD conditions. (Pl. Ex. 20O, Vol. 20.)

239. REA 63 calculations include charges for RAD workers' PPE clothing required when working in a RAD area, as well as charges for the project management, engineer, equipment operators and laborers involved. (Tr. 8/28/2007, 200:11-201:4; Pl. Ex. 20O, Vol. 20.)

240. Based on the foregoing, I find that MACTEC is entitled to \$91,059.80, exclusive of interest, for REA 63. (Pl. Ex. 20O, Vol. 20.)

241. I find that MACTEC is entitled to interest beginning December 3, 2004, the date MACTEC submitted its claim to BJC. (Pl. Ex. 20O, Vol. 20.)

242. I find that MACTEC is entitled to \$28,041.43 in prejudgment interest, computed at ten percent *per annum*, on the \$91,059.80 awarded for REA 63 for the time period commencing December 3, 2004 through December 31, 2007, and is entitled to interest at the daily amount of \$24.95 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 200, Vol. 20.)

P. REA 64/SCN 36 – Hoisting Procedure Change

243. BJC stipulated to a credit in MACTEC's favor in the amount of \$6,823.54 for REA 64. (Tr. 8/28/07, 207:17-25.)

244. I find that MACTEC is entitled to \$6,823.54, exclusive of interest, for its claim on REA 63. (Pl. Ex. 6, Vol. 3.)

245. I find that MACTEC is entitled to interest beginning July 18, 2007, the date MACTEC submitted its claim to BJC. (Pl. Ex. 6, Vol. 3.)

246. I find that MACTEC is entitled to \$310.33 in prejudgment interest, computed at ten percent *per annum*, on the \$6,823.54 awarded for REA 63 for the time period commencing July 18, 2007 through December 31, 2007, and is entitled to interest at the daily amount of \$1.87 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 6, Vol. 3.)

Q. SCN 41 – Work Rules

247. BJC stipulated to a credit in MACTEC's favor in the amount of \$4,700 for SCN 41. (Tr. 8/28/07, 180:13-181:1.)

248. I find that MACTEC is entitled to \$4,700.00, exclusive of interest, for its claim on Subcontract Change Notice 41. (Pl. Ex. 465, Vol. 37.)

249. I find that MACTEC is entitled to interest beginning May 23, 2005, the date MACTEC submitted its claim to BJC. (Pl. Ex. 465, Vol. 37.)

250. I find that MACTEC is entitled to \$1,305.70 in prejudgment interest, computed at ten percent *per annum*, on the \$4,700.00 awarded for SCN 41 for the time period commencing May 23, 2005 through December 31, 2007, and is entitled to interest at the daily amount of \$1.29 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 465, Vol. 37.)

R. Contour Fill Overrun

251. MACTEC is asserting a REA to recover costs associated with additional contour fill that MACTEC had to place due to (1) inaccurate topographical surveys provided by BJC, and (2) impacts from numerous “hot spots” located on the cap. (Tr. 8/31/07, 57:1-17, 72:3-25.)

252. MACTEC was required to place increased contour fill due to BJC’s inaccurate topographical surveys. (Tr. 8/31/07, 57:1-17; Pl. Ex. 541, Vol. 41.)

253. MACTEC identified the topographical bust in a REA to BJC dated January 19, 2001. (Pl. Ex. 20A, Vol. 19; Pl. Ex. 69, Vol. 26; Pl. Ex. 20A1, Vol. 19.)

254. BJC directed MACTEC to continue to meet its completion date for the Remedial Design Report (“RDR”) despite BJC having provided to MACTEC inaccurate topographical information survey data. (Tr. 9/5/07, 182:22-183:9.) There was a BJC milestone payment tied to the RDR completion date. *Id.* In fact, BJC threatened MACTEC

by issuing a “cure notice” to MACTEC once MACTEC informed BJC of the topographical bust. (Tr. 8/27/07, 121: 10-18.)

255. MACTEC finally received a change order regarding the inaccurate topographical survey data from BJC that only included engineering and survey work associated with that change. (Tr. 9/5/07, 183:13-24; Pl. Ex.4, Vol. 1, Tab 5.) BJC acknowledged gross inaccuracies in the survey data nearly six months after MACTEC first notified BJC. (Tr. 8/27/07, 123: 10-13.)

256. The bid documents stated that the bidders should anticipate “hot spots” equaling 500 cubic yards. (Pl. Ex. 3, Vol. 1, Q&A No. 56 Bates PX0003.0024.)

257. The Subcontract included a fixed price for “hot spots” to be covered by the cap for only 500 cubic yards. (Pl. Ex. 57, Vol. 24; Pl. Ex. 4, Vol. 1, No. 56.)

258. A “hot spot” is a radiological area on the cap that had to be “capped” to contain the radioactivity. (Tr. 9/5/07, 85:19-86.)

259. Once MACTEC encountered a “hot spot”, BJC directed MACTEC to cap that area instead of digging it up and disposing of it at the local landfill. *Id.*

260. Mark Cade had personal experience with hot spots on the Project. (Tr. 8/30/07, 85:19-22.) When MACTEC encountered a “hot spot”, BJC instructed MACTEC to cover the hot spot with additional clean fill because MACTEC could not excavate or grade any soil on the cap. (Tr. 8/30/07, 86:12-19.) The impact of the “hot spot” would depend upon where the “hot spot” was located on the cap. For example, if the “hot spot” was located in the section of the cap that could simply be taken care of by dumping fresh soil into the area and grading out that newly placed soil, then there would be a minimal impact to the Project. (Tr. 8/30/07, 87:6-22.) However, if the location of the “hot spot” was

at the bottom of the slope of the main cap, then MACTEC not only had to place new clean material on the “hot spot” area to cover it up, but would have to add more clean topsoil to the adjacent areas because of the change to the entire grade of the surrounding areas. *Id.* MACTEC had to meet and maintain specified grades so that the cap area could drain properly. *Id.* Stated differently, the increase in the volume of the additional soils to cover the “hot spots” required MACTEC to bring in additional clean soils in the local or surrounding areas so that they could maintain grade per the design. *Id.*

261. MACTEC extended the cap to cover “hot spots”. (Tr. 8/28/07, 6:1-15.)

262. The contour fill increased due to the requirement that MACTEC had to extend the cap to cover radiological “hot spots” beyond 500 cubic yards. (*Id.*; Tr. 8/30/07, 87:6-22.)

263. Much like MACTEC, BJC’s caps on other SWSA work grew from 94 acres to 111 acres because of inaccurate topographical information and also extending the cap to cover “hot spots.” (Tr. 9/6/07, 117:10-118:22.)

264. Much like MACTEC, BJC’s caps grew because they had to “chase slopes down to the end” because of the inaccurate topography. (Tr. 9/6/07, 118:1-9.)

265. Much like MACTEC, BJC’s rock quantities on other SWSA projects also increased more than they had estimated. (Tr. 9/6/07, 119:2-15.) BJC also used more rock quantities for its gas vent layers than they had estimated. *Id.*

266. Joe DuPree determined through interviews with MACTEC’s project personnel and review of the project documentation that MACTEC overran its estimated quantity of contour fill due to BJC’s failure to provide accurate topographical information to MACTEC. (Tr. 8/31/07, 56:19-57:17.)

267. DuPree also identified that there were other BJC's impacts that caused MACTEC to place more fill than expected. For instance, the frequency of unanticipated hot spots caused MACTEC to add more fill to achieve its grades and slopes on the Project. (Tr. 8/31/07, 72:3-25.)

268. DuPree relied upon MACTEC's geotechnical engineers to provide him with the quantities of expected contour fill and compared those quantities against the actual quantities of contour fill placed by MACTEC. (Tr. 8/31/07, 134:17-135:18; Pl. Ex. 280, Vol. 33; Pl. Ex. 20Q13, Vol. 20; Pl. Ex. 517, Vol. 41.) MACTEC's geotechnical engineers performed a take-off of the as-built drawings to determine the actual contour fill placed on the Project by MACTEC and gave that information to DuPree. *Id.* DuPree relied upon the actual quantities placed by MACTEC based upon MACTEC's internal engineers' take-off quantities. *Id.*

269. DuPree could have used the take-off quantities that BJC included in its PCCR report. (Tr. 8/31/07, 135:2-18.) In fact, DuPree's approach was much more conservative because the actual quantity figure he used was 176,000 actual cubic yards placed while BJC reported 216,000 actual cubic yards were placed. *Id.*

270. DuPree calculated MACTEC's contour fill claim by multiplying the price per cubic yard of contour fill against the cubic yards of additional fill MACTEC placed on the Project as a result of BJC's impacts. (Tr. 8/31/07, 68: 2-25, 69:1-25, 70:1-14; Pl. Ex. 517, Vol. 41, p. 517-0019, footnote 20.) This calculation produced the total burdened costs associated with MACTEC's contour fill claim of \$2,736,964. *Id.*

271. DuPree testified that the burdened cost of \$2,736,964 did not include MACTEC's profit of 10%. (Tr. 8/31/07, 70:15-25, 71:1-5.) DuPree testified, however, that

the profit calculation would be approximately \$273,000. *Id.* A ten percent (10%) profit on DuPree's calculation yields \$273,696.

272. Based on the foregoing, I find that MACTEC is entitled to the burdened cost of \$2,736,964 identified in DuPree's report as well as \$273,696 profit for a total claim of \$3,010,661, exclusive of interest, for increased contour fill. (Pl. Ex. 517, Vol. 41)

273. I find that MACTEC is entitled to interest beginning June 15, 2007, the date that MACTEC submitted its expert report to BJC. (Pl. Ex. 517, Vol. 41.)

274. I find that MACTEC is entitled to \$164,967.75 in prejudgment interest, computed at ten percent *per annum*, on the \$3,010,661.48 awarded for the contour fill claim for the time period commencing June 15, 2007 through December 31, 2007, and it is entitled to interest at the daily amount of \$824.84 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 517, Vol. 41.)

S. Extended Program Costs

275. Joe DuPree, MACTEC's expert on cost and scheduling issues, also identified a category of damages sustained by MACTEC associated with extended program costs. (Pl. Ex. 517, Vol. 41; Tr. 8/31/07, 83:5-11.) MACTEC incurred these additional program costs at the end of the Project because of the various BJC impacts identified by DuPree which impacted the critical path established in MACTEC's second baseline schedule. (Tr. 8/31/07, 75:1-23; Pl. Ex. 12, Vol. 5.)

276. These BJC impacts forced MACTEC to perform its originally scheduled work in a different time period which was hampered by unexpected weather impacts. (Tr.

8/31/07, 75:1-15.) These weather impacts significantly impacted MACTEC's ability to perform its originally schedule work. *Id.*

277. DuPree determined through his critical path analysis that MACTEC's re-baselined schedule's critical path ran through the cap work which also included the WTF and the DGT. (Tr. 8/31/07, 40:4-25.)

278. DuPree determined through his critical path analysis that BJC's descoping of the WTF operation of MACTEC's treatment system, which was part of the critical path, and other BJC impacts extended the contract performance. (Tr. 8/31/07, 74:4-75:24.) DuPree performed a critical path analysis to determine the extended program cost impacts due to BJC-caused impacts. (Tr. 8/31/07, 129:12-130:11.)

279. As a result of these BJC-responsible impacts, I find that BJC is responsible to MACTEC for damages sustained for extended site overhead from October 30, 2004 through July 5, 2005. (Tr. 8/31/07, 83:5-11; Tr. 9/4/07, 118:21-119:12; Pl. Ex. 12, Vol. 5.)

280. DuPree and Curtis Lowther calculated MACTEC's extended program cost by compiling the costs incurred from October 30, 2004 through July 5, 2005. (Tr. 8/31/07, 83:5-11; Tr. 9/4/07, 118:21-119:12; Pl. Ex. 12, Vol. 5.) MACTEC concluded that the total burdened cost for this period of time was \$833,000, exclusive of 10% profit and interest. (Tr. 9/4/07, 119:4-12.)

281. A ten percent (10%) profit on this calculation yields \$83,300.

282. Based on the foregoing, I find that MACTEC is entitled to the burdened cost of \$833,000 based upon the impacts cited in DuPree's report as well as \$83,300 in

profit for a total claim value of \$916,300, exclusive of interest, for its extended program claim.

283. I find that MACTEC is entitled to interest beginning June 15, 2007, the date that MACTEC submitted its expert report to BJC. (Pl. Ex. 517, Vol. 41.)

284. I find that MACTEC is entitled to \$50,208.22 in prejudgment interest, computed at ten percent *per annum*, on the \$916,300.00 awarded for the extended program costs for the time period commencing October 30, 2004 through July 5, 2005, and it is entitled to interest at the daily amount of \$251.04 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 517, Vol. 41.)

T. MACTEC's REAs: Review, Consideration and Payment by BJC

285. According to BJC's Project Manager, BJC reviewed REAs when submitted. BJC reviewed late submitted REAs and determined whether the REA had merit. There was no blanket response by BJC that because a REA was not submitted timely, it would not be considered. (Tr. 9/5/2007, 33:4-22.)

286. MACTEC did not typically provide timely notification of REAs. However, BJC did not enforce the notice requirements on the REAs settled to date. (Tr. 9/5/2007, 33:23-34:7.)

287. The 11 REAs submitted by MACTEC in April 2004 were not prepared and submitted in accordance with the time requirement in the Subcontract. Some of these untimely claims were negotiated and settled by BJC. (Tr. 8/27/07, 111:5-112:17; Pl. Ex. 332, Vol. 34; Pl. Ex. 550, Vol. 41; Pl. Ex. 4, Vol. 1, Bates PX0004.0420.)

288. During the Project, there were no claims asserted by MACTEC to BJC denied based on the failure to comply with notice requirements. (Tr. 8/30/07, 30:6-11.)

289. During the Project, there were no claims submitted by MACTEC to BJC where BJC refused to negotiate because of lack of timely notice. (Tr. 8/30/07, 30:12-15.)

290. During the Project, there were MACTEC claims which failed to meet the contract notice requirements that were entertained, negotiated and paid by BJC. (Tr. 8/30/2007, 30:16-21; Tr. 8/27/07, 110:4-111:4.)

291. BJC argues that it did not waive its notice defenses through its consistent failure to assert or enforce the Subcontract's notice requirements because of a non-waiver provision found in General Condition GC-07. Thus, it argues that it can now enforce the Subcontract's strict notice requirements despite its previous consistent practices to the contrary.

292. MACTEC submitted numerous REAs that did not comply with the strict contractual notice requirements throughout the course of the Project. (Tr. 8/30/07, 30:16-21; Tr. 8/27/07, 110:4-111:4.) BJC never once objected to or asserted a defense against MACTEC's "non-compliant" REA submittals. *Id.* To the contrary, BJC settled many of these same "late noticed" REAs. *Id.*

293. I find that despite the existence of a non-waiver provision in the Subcontract, BJC waived that provision through its course of conduct by continuously accepting, negotiating and settling MACTEC's REAs throughout the course of the Project that did not comply with the strict notice requirements. I further find that BJC did not object to any of the alleged late-noticed REAs during the course of the Project. Thus, the court finds that BJC waived both the notice and non-waiver provisions in the Subcontract.

294. BJC further argues that it was prejudiced by MACTEC's REAs' alleged untimely notice. BJC claims that MACTEC provided notice and submitted REAs 50, 51, 52, 53, 54, 55, 56, 59, 60 and 63 on December 3, 2004, REAs 57, 64, 65, 66, 69, 71, and 73 on July 17, 2007, and notified BJC of MACTEC's extended program costs and contour fill overrun on June 15, 2007.

295. However, with respect to many of MACTEC's REAs, BJC was aware of the bases of the claims prior to the date that formal notice was provided by MACTEC. For example, BJC was aware of the topographical survey inaccuracies as early as December 27, 2000. (Pl. Ex. 20A., Bates BJCSWSA4-61032, Vol. 19.) MACTEC then submitted a REA to BJC for the engineering portion, but not the contour fill portion, of the topographical inaccuracies on January 19, 2001. (Pl. Ex. 20A, Vol. 19; Pl. Ex. 69, Vol. 26; Pl. Ex. 20A1, Vol. 19.) In that REA, MACTEC informed BJC that "the difference between the elevations shown on the drawings issued to MACTEC, Inc. ... will increase our fill quantities by 50,000 cubic yards to 104,000 cubic yards ... [i]n order to mitigate the effect, MACTEC, Inc. proposes a redesign of the SWSA 4 Cap Area." *Id.*

296. Frank Cater, BJC's Project Manager on the balance of cap work, testified that his projects also experienced "hot spots," inaccurate topographical surveys and a "growth in the caps." (Tr. 9/5/07, 85:19-86:19; Tr. 9/6/07, 117:10 – 119:15.) Cater testified that BJC added more contour fill and rock to correct the topographical errors. *Id.* This is the same approach MACTEC employed. (Tr. 8/29/07, 38:18 - 39:13; Tr. 8/28/07, 16:1-15.)

297. BJC was also aware of the severe weather MACTEC encountered because BJC received time extensions for the very same weather impact. This unusually severe weather impacted MACTEC's ability to efficiently perform its work.

298. I find that BJC was aware of the impacts to MACTEC's work that now form the bases for MACTEC's REAs. BJC was aware of these impacts through the project correspondence and because it experienced some of the very same impacts as MACTEC. I find that MACTEC submitted its formal claims in December 2004 and July 2007, but the evidence is clear that BJC was well aware of the issues that comprise MACTEC's REAs at the time the issues arose.

299. I also find that BJC did not, nor could it, provide any alternative method to mitigate these impacts. In fact, I find that BJC and MACTEC both employed the very same approaches to correct the cap growth by adding more contour fill and addressed the unusually severe weather impacts on cap work by adding more vent layer. I find that BJC was not prejudiced by MACTEC's notice. Other than BJC's conclusory contention that it has been prejudiced, BJC has not introduced any evidence to demonstrate how, with respect to any one of MACTEC's REAs, BJC suffered any actual prejudice.

300. Moreover, the parties scheduled MACTEC's 30(b)(6) corporate representatives' deposition for July 18 2007. (Tr. 8/29/07, 182:20-23.) The parties also scheduled Joe DuPree's deposition for August 16, 2007. (D. Ex. 310.) BJC examined the bases of MACTEC's REAs during these depositions.

301. I find that BJC did not suffer any prejudice from MACTEC's claims because they were submitted either prior to, or during the course of discovery and BJC had ample time to question MACTEC's witnesses regarding MACTEC's REAs during their

respective depositions. I find that MACTEC's REAs should not come as a surprise to BJC, and BJC has failed to demonstrate any prejudice.

302. Contrary to Special Condition 20 – Excusable Delays, BJC paid MACTEC for pure delay claims asserted in REA 25, REA 26, REA 27, REA 29, REA 31 and REA 32. (Tr. 8/30/07, 32:15- 34:10.)

303. BJC considered and paid MACTEC costs identified in a REA for differing site conditions, although MACTEC's REA did not meet the Subcontract's notice requirement. (Tr. 8/27/07, 118:9-119:13, 123:10-19; Pl. Ex. 61, Vol. 26.)

304. During the Project, REAs that included estimated costs were negotiated and paid by BJC. (Tr. 8/30/07, 36:23-37:7.)

305. BJC considered and paid MACTEC costs identified in REAs for acceleration. (Tr. 8/27/07, 113:4-13; Pl. Ex. 4, Vol. 1, Tab 32.) BJC negotiated and settled MACTEC's previous claims for acceleration although MACTEC's claims were not submitted in accordance with the Subcontract's notice requirements. *Id.*

306. During the Project, BJC paid MACTEC REAs that included indirect cost such as supervision and overhead as percentages of direct cost. (Tr. 8/30/07, 37:8-16.)

307. BJC negotiated and ultimately settled MACTEC's REAs that were not prepared and submitted in accordance with the Subcontract requirements. (Tr. 8/27/07, 112:1-17; Pl. Ex. 332, Vol. 24; Pl. Ex. 550, Vol. 41.)

308. I find that MACTEC's REAs 51, 52, 53, 54, 55, 56, 59, 60, and 63 were submitted during the course of the Project and were considered by BJC although these REAs did not meet the Subcontract's notice requirements. (Tr. 8/27/07, 115:1-117:20; Pl.

Ex. 20E07, Vol. 19.) Despite a lack of compliance with the Subcontract's notice requirement, BJC did not assert any notice defense. *Id.*

309. MACTEC used the same document template for pricing REAs which includes G&A rate, overhead, fringe rate, craft fringe and profit. MACTEC's Corporate Accounting Department calculates and provides the G&A rate, overhead, and fringe rates. The craft fringe rate is calculated from the Construction Labor Agreement. A markup of .10 or 10 percent is included for profit. This information is contained on the left hand side of the REA pricing sheets. The numbers on the right hand side of the REA pricing sheets are the marked-up numbers from MACTEC's corporate office for subcontractors and material suppliers. (Tr. 8/28/07, 133:19-135:3.)

310. BJC cites General Condition GC-20 and alleges that MACTEC did not substantiate its claims for additional costs. BJC argues that MACTEC did not provide any supporting documentation such as third-party invoices, proposals, superintendents daily logs, time sheets, or supporting cost records to substantiate its charges. BJC requests that this Court find that MACTEC did not substantiate its manhours or equipment time incurred with contemporaneous project documents.

311. MACTEC's damages are supported by trial testimony, daily reports, invoices, actual cost records, project correspondence, project schedules, and third party certifications that were introduced into evidence. (*Not an all inclusive list:* See, Pl. Ex. 22, Vol. 21; Pl. Ex. 18, Vol. 7; Pl. Ex. 7AK, Vol. 3; Pl. Exs. 20L2, 20L18, 20L48, 20N10, 20N2, 20L1, 20L7, 20O1, 20O2, 20O3, 20O4, 20P2, 20P5, 20P6, 20P7, 20P9, 20P10, 20P11, 20P12, 20P14, 20P16, all in Vol. 20; Pl. Ex. 230 Vol. 31; Pl. Ex. 501 Vol. 38; Pl. Ex. 502 Vol. 38; Pl. Ex. 507 Vol. 38.)

312. The trial record contains testimony from MACTEC's Matt Foster, Mark Cade and Jim Bowman regarding the exhibits that support MACTEC's REAs. (Tr. 8/28/07, 29:17–25; 84:15–24; 168:6–23; 194:2–21; Tr. 8/29/07, 146:10–21; Tr. 8/30/07, 27:6 – 28:8; 124:4–18.)

313. As the SWSA 4 Project Manager and project controls' analyst, Foster visited the job site several times a week and observed the field activities so that he had an understanding of the schedule and any impacts to the schedule. (Tr. 8/28/07, 101:14 – 102:17; 102:23 – 103:11.)

314. As the Project's superintendent, Jim Bowman's office was located at the site. (Tr. 8/27/07, 189:11–19.) He was at the site every day and frequently attended meetings to address the Project's progress. (Tr. 8/27/07, 189:22 –189:9; 191:12–23.) Bowman testified to his personal experiences regarding the (1) installation of a gas venting system (installing stone on top of the saturated cap and wood chips); (2) the installation of the upgradient trench (continuous trencher decontamination); (3) development of the IHP (the "dirt burrito" issue); (4) MACTEC's maintenance of the haul road; and (5) work performed in the Wetlands area. (Tr. 8/27/07, 194:6 – 198:3.)

315. As the Project's Resident Engineer, Mark Cade's office was located in the Project's job trailer where he devoted all of his working time to the Project during the 2004 calendar year. At least a third of his time was spent in the field. (Tr. 8/30/07, 79:17 –80:7.) Cade testified from personal knowledge regarding the haul road accident and growth in the SWSA 4 Cap. (Tr. 8/30/07, 81:10 – 84:18)

316. MACTEC's senior accountant familiar with the SWSA 4 Project, Curtis Lowther, provided testimony regarding MACTEC's actual costs incurred on the Project. (Tr.

9/4/07, 104:1–3; 108:3–8; 116:4 – 117:25.) Lowther testified that MACTEC’s fully burdened costs on the Project totaled \$31,991,000. (Tr. 9/4/07, 117:14–25.)

317. I find that MACTEC presented testimony from credible witnesses who had first-hand, personal knowledge of the daily impacts to MACTEC’s work and the damages suffered as a result. MACTEC’s REAs are substantiated by its exhibits and first-hand testimony from its Project Manager, Project Engineer and Site Superintendent.

318. On the other hand, BJC cites to only one instance that is based upon Robert Spurling’s personal experience. This testimony was based on traveling through the particular area only “three, maybe four times’ during the two-month period affected.”

319. Spurling was initially the Subcontract Technical Representative (“STR”) for the design phase of SWSA 4. (Tr. 9/4/07, 133:5–16.) In 2000, his responsibilities changed to include developing an accelerated closure plan and the related scope of work for all the other capping activities within Melton Valley. (Tr. 9/4/07, 133:17 – 134:3.) In 2003, he then became the “Task Lead” for all the projects in the entire Melton Valley site. *Id.*

320. Spurling relied upon alleged out of court statements made by BJC’s SWSA 4 STRs and various regulators and DOE officials during his testimony. (Tr. 9/5/07, 89:19 – 90:2; Tr. 9/4/07, 217:13–23.)

321. The court specifically asked BJC whether it was going to present a regulatory official to testify to these out of court statements. (Tr. 9/4/07, 218:2–5.) BJC replied: “[w]e are planning to Your Honor.” *Id.* They never did.

322. BJC claims, without citing to any evidence, that Spurling was “responsible for the day-to-day operations, was at the SWSA 4 site on a daily basis and

was routinely involved in the communications and discussions between BJC and MACTEC about completion of the work at SWSA 4." Yet, the court finds that there is absolutely no evidence in the record to substantiate Spurling's involvement on the SWSA 4's day-to-day issues. To the contrary, the evidence indicates that Spurling was heavily involved in several other Melton Valley projects while he was simultaneously overseeing work on SWSA 4. The court further finds that Spurling was admittedly only involved, on a more regular basis, with the completion of the SWSA 4 work. The completion of the SWSA 4 work occurred in early 2005.

323. In addition to Spurling, BJC proffered three (3) other fact witnesses: Frank Cater, Michael Sholley and Mary Beth Blair. Frank Cater did not become involved in the SWSA 4 project until June 2005. Sholley became involved in the SWSA 4 project in August 2005. Blair was only familiar with the Project from a "high level," and did not "know anything technical about the project." (Tr. 9/5/07, 202:10-13.)

324. MACTEC completed its construction work activities in February 2005.

325. I find that BJC did not offer any fact witnesses that had knowledge of the Project during its performance. BJC did not provide testimony from its superintendents, engineers, quality supervisors or STRs. Outside of Spurling – who had limited first-hand knowledge of the Project given his involvement in several other Melton Valley projects – BJC provided the testimony of witnesses who were engaged after the construction work was completed. BJC's fact witnesses lack the requisite knowledge to credibly refute MACTEC's witnesses' accounts of BJC's daily impacts and the damages suffered by MACTEC.

326. BJC contends that MACTEC did not properly segregate the Project's costs.

327. MACTEC tracked its actual costs in two separate accounting databases: an Oracle and CostPoint database. (Tr. 9/4/07, 116:4–24; 108:6–25.) The individual transactions on the project were assigned a cost code. (Tr. 9/4/07, 120:15 – 121:12.) The cost codes were set up to reflect the type of work performed on the project (the schedule activities) and track the actual costs accordingly. (Tr. 8/29/07, 95:20 – 96:16.) MACTEC was able to assemble the costs that were collected against each individual work item by the cost codes. (Tr. 8/29/07, 34:8 – 35:3; Tr. 8/28/07, 135:17 – 136:11; Pl. Ex. 7, Vol. 3) MACTEC relied upon these cost codes to compute its damages. *Id.*

328. I find that MACTEC properly tracked its actual costs and was able to segregate its costs by cost code to the individual schedule activities that comprise its REAs.

III. CLAIMS RELATING TO THE DOWNGRADIENT TRENCH

A. The ROD

329. The Subcontract requires that MACTEC provide a hydraulic isolation system that includes, among other components, the “collection and treatment of downgradient groundwater...” (Pl. Ex. 57, Vol. 24, Bates PX0057.0070.) MACTEC’s Subcontract performance was to be measured in part, by “start[ing] operation of all required remedy components within the specified Scope of Work” *Id.* The Subcontract also required MACTEC to design, construct, install, and operate a system to treat water collected in the

downgradient groundwater collection system [and to] operate the treatment unit through one wet season – before transferring to [BJC's] Surveillance and Maintenance Subcontractor – to demonstrate system operability, reliability, and its ability to meet discharge requirements. The “discharge requirements” referred to in Section 2.3.4 are those set out in the second bulleted performance measure quoted above, Bates PX0057.0070 and PX0057.0073. The Subcontract provides that the “wet season is defined as the time from November through March.” *Id.* Bates PX0057.0073; §2.3.4. The treatment unit is referred to in Paragraph 2.3.4 of the Scope of Work as the Water Treatment and Monitoring System (“Water Treatment Facility” or “WTF”). *Id.*, Bates PX0057.0073, ¶2.3.4. The WTF is the only component of the hydraulic isolation System that is “operable”. *Id.*

330. The downgradient trench (“DGT”) was constructed along the southern and southeast perimeter of the SWSA 4 cap. The DGT was approximately 1200 feet in length and approximately 3 feet wide. The DGT was designed and constructed of three sections each of approximately 400 feet in length, with each section separated from the other by a section of *in situ* material of approximately 10 feet. These trench sections were designated as trench Sections A, B, and C. (Tr. 8/30/07, 101:24-102:18; Tr. 8/31/07, 178:9-179:10.) The DGT was dug to bedrock. (Tr. 8/27/07, 63:1-9, 96:9-22; Tr. 8/31/07, 180:12-19.) Thereafter, it was filled with specified stone. (Tr. 8/31/07, 179:14-16.) Within each trench section were four sumps consisting of an eight inch screened pipe that would allow for the inflow of water from the trench into the sump. MACTEC placed a pump in one of the four sumps within each trench section such that there were three pumps within the entirety of the trench: one in Section A; one in Section B; and, one in Section C. (Tr. 8/30/07, 102:19-103:9; Tr. 8/31/07, 180:19-182:6; Pl. Ex. 570.)

331. The DGT was to be operated by running pumps within the sumps and transferring contaminated water from the DGT to the WTF so that the water level in the trench would be lower than the water level of the *in situ* material immediately downgradient of the DGT. This would create an “inward flow” from the downgradient side of the DGT, into the DGT. (Tr. 8/27/07, 63:17-65:2; Tr. 8/31/07, 177:7-178:8.) By maintaining such an inward flow, MACTEC could achieve the performance measure of the Subcontract that MACTEC was to “[e]nsure that within two years after SWSA 4 construction is complete, there is no contaminated groundwater and/or surface water release from SWSA 4 that would cause exceedances of AWQC for protection of fish and aquatic life... into the SWSA 4 Tributary at its confluence with White Oak Creek”. (Tr. 8/27/07, 81:20-82:19; Pl. Ex. 3, Vol. 1 Bates PX0003.0027; Tr. 8/27/07, 90:6-92:2; Pl. Ex. 57, Vol. 24 Bates PX0057.0070.)

332. The Subcontract requires that MACTEC is to install a “downgradient collection system at the SWSA 4 cap boundary” and that the “system is to collect contaminated water from the capped area, preventing discharge to local surface water.” (Pl. Ex. 57, Vol. 24, Bates PX0057.73 §2.3.3.)

333. The Subcontract is consistent with the ROD. The design, construction, and operation of the WTF at the SWSA 4 site was part of the recommended remediation for the SWSA 4 Project site. (Tr. 8/27/07, 55:25-56:2; Pl. Ex. 55, Vol. 23; Tr. 8/31/07, 184:20-185:14.) According to the ROD, the WTF's purpose was to treat the water collected in the DGT. (Tr. 8/27/07, 64:1-3; Pl. Ex. 55, Vol. 23.) As BJC's Spurling admitted at trial, MACTEC “couldn't operate the hydraulic isolation system, the downgradient trench portion of the SWSA-4, unless you had a place to pump the water to.” (Tr. 9/4/07, 156:5-11.)

334. Based upon the requirements of the ROD and Subcontract, the DGT could not function or operate without a water treatment facility. (Tr. 8/27/07, 54:17-25; Tr. 9/4/07, 24:22-25:5.) In other words, the water may be collected in the DGT, but without the WTF, it would have nowhere to go for treatment. *Id.* The ROD required that the collected water be run through a treatment facility for filtration and treatment. (Tr. 8/27/07, 55:1-4; Pl. Ex. 55, Vol. 23.)

335. According to the ROD, the WTF was closely linked with the operation of the DGT. (Tr. 8/31/07, 171:8-16.) That is, the water collected in the DGT must be treated before it is discharged to the local environment. *Id.* The ROD expressly stated that the WTF was part of the downgradient water collection system. (Tr. 8/27/07, 69:17-70:3; Pl. Ex. 55, Vol. 23.)

B. Design of the DGT

336. MACTEC's DGT design intent was to create a hydraulic barrier that would capture any water coming from underneath the SWSA 4 cap and prevent its discharge to the IHP. (Tr. 8/27/07, 64:4-10; Pl. Ex. 57, Vol. 24, Sect. 2.3.3; Joint Ex. 1, Mitchell Dep. 89:1-90:2; Tr. 8/31/07, 183:1-10.) This intent was consistent with the ROD. *Id.*

337. MACTEC's DGT design intent was also to create a preferential path for water to flow into the DGT from the SWSA 4 cap area and adjacent areas downgradient from the DGT. (Tr. 8/27/07, 64:18-22.) MACTEC's DGT, as constructed, created a preferential path flow for the water. (See BJC's response to MACTEC's Request for Admission No. 101; Pl. Ex. 511, Vol. 38, Bates PX0511.0018.)

338. The DGT had flexibility built into it by including three separate trench segments (A, B, C) versus one long trench segment and including multiple sumps in each trench segment so that pumps could be interchanged between the various sumps. (Tr. 9/4/07, 36:20-37:8; Tr. 8/31/07, 178:16-179:10, 185: 1-3; Joint Ex. 1, Mitchell Dep. 66:25-67:13.) MACTEC's flexible design allowed for better control over the collection of the groundwater. *Id.*

339. The Subcontract required that MACTEC develop and submit to BJC a Remedial Design Report/Remedial Action Work Plan ("RDR/RAWP") "to document the design and [MACTEC's] approach for field implementation and to demonstrate how the approach will meet the performance criteria." (Pl. Ex. 57, Vol. 24, Bates PX0057.71, ¶2.1.) The DGT ground-water elevation monitoring plan is described in the RDR/RAWP and in the Operations and Maintenance Plan (Appendix L of the RDR/RAWP). ("O&M Plan") (Pl. Ex. 109, Vol. 29, Bates BJC SWSA4-105833.) Each of the three trench segments was to have a single pair of piezometers installed for the purposes of determining whether inward flow had been achieved in the area immediately adjacent to the DGT. (Joint Ex. 1, Mitchell Dep. 88:20-89:7; Tr. 8/31/07, 202:14-23.) One piezometer of each pair would be installed within the trench, while the second would be installed opposite the first to the east of the trench. *Id.*

340. Piezometer pair PZ-5A and PZ-5B was to be used to determine whether there was an inward gradient to trench segment A. (Tr. 8/31/07, 202:24-203:18; Joint Ex. 1, Mitchell Dep. 88:20-90:2.) Likewise, PZ-6A and PZ-6B was to be used to determine whether there was an inward gradient to trench B, and PZ-7A and PZ-7B was to be used to determine whether there was an inward gradient to trench C. *Id.*

341. The operation of the DGT with three pairs of piezometers was not a static plan. (Tr. 8/31/07, 203:14-18.) As noted in the O&M Plan “[i]t may also be necessary to propose additional locations if the placement of wells and piezometers and the data that they yield suggest inadequate data to make a full evaluation.” (Tr. 9/4/07, 37:12-20; Tr. 8/31/07, 203:2-18.)

342. It was MACTEC’s intent to operate the DGT as outlined in its O&M Plan. (Tr. 8/27/07, 126:8-19; Joint Ex. 1, Mitchell Dep. 67:14-20.) The O&M Plan stated that MACTEC was to monitor the performance of the DGT by operating it through one wet season. *Id.* The operation of the DGT required pumping water through the WTF. (Tr. 8/27/07, 126:8-25; Joint Ex. 1, Mitchell Dep. 113:23-115:25.)

343. It was understood by MACTEC that field conditions would likely vary from the conditions used to “model” the DGT, and that the pumps’ set-point elevations would need to be altered to reflect the measured field conditions. (Pl. Ex. 518, Vol. 41, pg. 8; Tr. 8/31/07, 198:21:-199:24; Joint Ex. 1, Mitchell Dep. 113:23-115:25.)

345. BJC’s expert, Dr. George Pinder, conceded that if the DGT had an inward gradient at the intersection of the DGT and the downgradient side of the DGT, then the DGT would create a hydraulic barrier precluding contaminants from escaping through to the downgradient side of the DGT. (Tr. 9/6/07, 84:5-85:5.)

346. Dr. Pinder testified that there is no deficiency in MACTEC’s design of the DGT. (Tr. 9/6/07, 69:16-22.)

C. The Water Treatment Facility

347. BJC instructed the bidders to rely upon the RFP's Scope of Work regarding the construction of the SWSA 4 WTF. According to question 61 in BJC's response to questions from bidders, BJC stated that the bidders should expect to construct a new treatment facility at the SWSA 4 location and disregard contradictory language in the ROD, if any, that stated that there may be an upgrade to an existing facility. (Tr. 8/27/07, 81:1-16; Pl. Ex. 3, Vol. 1, Q&A No. 61 Bates PX0003.0045.) This is confirmed by the Subcontract itself which requires MACTEC to design and construct a downgradient groundwater collection system and design, construct, install, and operate a WTF system to treat water collected in the downgradient groundwater collection system. (Pl. Ex. 57, Vol. 24, Bates PX0057.0073 §§2.3.3 and 2.3.4.)

348. BJC informed the bidders that they would have two years to monitor the SWSA 4 site and also two years to show that the performance of constructed remedial actions were meeting the performance criteria listed in the Subcontract. (Tr. 8/27/07, 82:5-19; Pl. Ex. 3, Vol. 1, Q&A No. 74 Bates PX0003.0048; Pl. Ex. 55, Vol. 23, Bates MACTEC SWSA 023123.) The Subcontract establishes an identical two year period in which to meet the performance measures. (Pl. Ex. 57, Vol. 24, Bates PX0057.0070.)

349. The Subcontract's Scope of Work required MACTEC to "start operations of all required remedy components." (Pl. Ex. 57, Vol. 24, Bates PX0057.0070.)

350. The Subcontract's Scope of Work provides that MACTEC shall install a downgradient groundwater collection system at the SWSA 4 cap boundary and this reference to the "collection system" includes the WTF. (Tr. 8/27/07, 95:22-96:8; Pl. Ex. 57, Vol. 23; Bates PX0057.0073, §2.3.4.)

351. The WTF was also technically essential to the operation of the DGT and the collection system in that MACTEC's design did not allow for the operation of a DGT without the operation of the WTF. (Tr. 8/31/07, 184:7-20; Joint Ex. 1, Mitchell Dep. 192:9-19.)

352. MACTEC's Subcontract and design entitled MACTEC to a five-month start-up period, during which time MACTEC planned to make any necessary adjustments, including settings within the WTF, setting the pumping levels in the DGT or even adding additional pumps. (Tr. 8/31/07, 271:19-272:3, 184:20-185:14; Joint Ex. 1, Mitchell Dep. 117:1-22.) MACTEC was also entitled to be paid over \$200,000 to operate the WTF during the five-month operations period specified in the Subcontract. (Tr. 9/5/07, 126:16-23; Tr. 8/31/07, 272:10-19.) The five month wet season was from November through March and was not tied to a specific calendar year. (Tr. 9/5/07, 121:18-25.)

353. In fact, MACTEC developed the O&M Plan that provided detailed aspects of MACTEC's anticipated adjustments to both the WTF and DGT. (Tr. 8/31/07, 180:20-185:14; Joint Ex. 1, Mitchell Dep. 75:9-76:4.) The O&M Plan expressly contemplated that MACTEC would have the opportunity to turn on the DGT and WTF system, operate it and collect monitoring data to make recommended modifications and/or adjustments to the System in order for the System to meet its performance objectives. (Tr. 9/4/07, 24:22-25:5; Joint Ex. 1, Mitchell Dep. 98:8-99:16; Tr. 8/31/07, 271:19-272:3.)

354. MACTEC's O&M Plan specified the use of monitoring information gathered from the as-built DGT and WTF to identify potential problems within the DGT that would need to be adjusted. (Tr. 8/31/07, 201:7-16.) The only way MACTEC could obtain this monitoring data was to operate the WTF in conjunction with the DGT. (Joint Ex. 1,

Mitchell Dep. 113:23-115:25; Tr. 8/31/07, 201:17-25.) The monitoring data was also used to set the point elevations and adjust the elevations for the switches for the pumps that were to be placed within the sumps in the DGT. (Joint Ex. 1, Mitchell Dep. 113:23-115:25; Tr. 8/31/07, 204:13-21; Pl. Ex. 109, Vol. 29; Tr. 9/4/07, 38:3-25.)

355. MACTEC's technical expert, Dr. Shanahan, concluded that the DGT is part of the overall hydrologic isolation system. The DGT captured contaminated water flowing from below the capped area at SWSA 4. The captured water in the DGT is directed to the WTF for treatment. The treated water is then discharged to the IHP. (Tr. 9/4/07, 23:15-25:5.)

356. To operate the DGT, the WTF had to be available to process the water that was collected in the DGT. (Tr. 9/4/07, 155:25-156:11.) It was important for MACTEC to be able to operate the WTF because it would allow the parties to determine whether the System met the performance criteria set forth in the Subcontract. (Tr. 9/4/07, 27:17-28:13; Tr. 8/30/07, 107:3-12.)

357. Dr. Shanahan concluded that adjustments to the as-installed DGT would be required during a "shakedown" period based upon the actual conditions of the site. (Tr. 9/4/07, 32:1-15.) This shakedown period is critical because the System's design is based only on models, not the actual site conditions encountered. (Tr. 9/4/07, 32:16-25.)

358. The significance of the period within which MACTEC had to operate the collection system and make adjustments to the System was critical because MACTEC's System would not have an immediate impact on the groundwater traveling through the site. (Tr. 9/4/07, 27:3-16.) Dr. Shanahan testified that groundwater tends to flow very slowly and it would take a period of time for the groundwater to travel through the System and the

effects of MACTEC's implemented remedial components would not have an immediate significant change to the local environment. *Id.* This period gave MACTEC a window to see the full performance of the System. *Id.*

D. The Discovery of Silt in the Sumps

359. In July 2004, MACTEC began to prepare to operate the WTF and the DGT. (Tr. 8/27/07, 129:1-7.) In preparing for the startup, MACTEC took water samples collected in the DGT and attempted to set the pump level switches. (Tr. 8/27/07, 129:1-7; Tr. 8/30/07, 88:11-25.) In attempting to set the pump elevations MACTEC discovered the presence of siltation in the sumps. *Id.*, 88:11-89:6.

360. While BJC contends that MACTEC did not protect the DGT from run-off with silt fence or other measures, to prevent soil and silt from entering the DGT while the construction of the cap was underway, the record is replete with references to the adequacy of MACTEC's installation and maintenance of silt fence and other erosion controls. However, BJC makes these assertions in order to suggest that MACTEC is responsible for the silt's migration into the DGT's sumps. However, a more plausible explanation is that BJC's consistent and unrelenting refusal to grant MACTEC any time extensions for adverse weather required that MACTEC work in extremely muddy conditions, rather than allowing the site to dry out as is customary, and thus created an environment in which silt was stirred up and suspended in rainfall runoff, which due to its volume made its way into the DGT's sumps. BJC did not demonstrate to this Court that MACTEC was responsible for the silt found in the DGT's sumps, or the extent to which, if any, silt was in the DGT itself. What is clear, however, is that BJC did not remove any silt

from the DGT, and satisfied the performance requirements of the Subcontract through minor physical modifications to the DGT which would likely have been discerned by MACTEC had it been permitted to operate the WTF and DGT.

361. The evidence indicates that MACTEC installed erosion control (silt fencing) upgradient of the DGT between the DGT and the cap once MACTEC started construction of the cap. (Pl. Ex. 18, photograph 74, Vol. 7; Tr. 8/28/07, 29:3-30:8; Pl. Ex. 18, photograph 76, Vol. 7; 32:7-9.)

362. MACTEC's crew, under the direct supervision of Jim Bowman, maintained the silt fences during the course of the Project. (Tr. 8/28/07, 31:11-23.) MACTEC would maintain the silt fencing by replacing or repairing those sections that would be washed out by storms. *Id.*

363. The BJC representative responsible to ensure that MACTEC installed and maintained adequate erosion control methods was the Environmental Safety & Health ("ES&H") representative. (Tr. 9/5/07, 151:4-10.) BJC never issued a non conformance report ("NCR") to MACTEC for inadequate erosion controls on the Project. (Tr. 9/5/07, 151:11-21.) On the contrary, there are many examples of meeting minutes wherein BJC recognized MACTEC for the high quality of its erosion control work on the Project. (Tr. 9/5/07, 152:18-22; Pl. Ex. 15, Vol. 8, Bates MACTEC SWSA 021902 dated 11/7/02; Bates MSEP 042220 dated 12/19/02.) MACTEC's daily field reports also indicate that MACTEC properly maintained erosion controls, including silt fencing, on the entire project. (Pl. Ex. 20P09; Pl. Ex. 20P16; Pl. Ex. 20P17; Pl. Ex. 20P18, Vol. 20.)

364. Two of BJC's backcharges show that there were silt fences at the Project site left behind by MACTEC. (D. Ex. 221, BATES BJC SWSA4-58085; D. Ex. 243.)

These two BJC backcharges attempt to collect money from MACTEC for the “removal of silt fence” and the disposal of “approximately 1,000 ft of silt fencing.” *Id.*

365. BJC relies exclusively upon Spurling’s hearsay testimony, which is based upon conversations with other unidentified BJC personnel, to claim that MACTEC did not install a silt fence upgradient of the DGT. (Tr. 9/4/07, 150:16 – 151:16.)

366. Toward the end of the Project, MACTEC would simply cover up the erosion control (silt fencing) upgradient of the DGT with contour fill when it extended the cap over the DGT. (Tr. 8/28/07, 82:3–15; Pl. Ex. 18, photograph 76, Vol. 7.) There would not be a need to keep the silt fencing upgradient of the DGT once MACTEC began to extend the cap over the DGT because it would be destroyed by the contour fill that was being placed over the DGT. (Tr. 8/28/07, 80:11-81:10, 82:11-15; D. Ex. 217.)

367. Based on the foregoing, I find that MACTEC installed erosion controls (silt fencing) between the DGT and the cap. MACTEC installed this silt fencing at the beginning of the cap work.

368. I find that MACTEC properly maintained the silt fencing by routinely repairing and replacing damaged sections. I also find that BJC did not issue any NCR’s regarding MACTEC’s failure to install or maintain silt fencing near the DGT, but instead BJC commended MACTEC for its erosion control methods.

369. I also find that MACTEC’s superintendent, Jim Bowman, personally supervised the installation and maintenance of these silt fences during his time at the Project. MACTEC properly protected the DGT during construction by erecting and maintaining a silt fence around the DGT.

370. I find that BJC has provided no credible evidence to refute Bowman's personal knowledge or the numerous exhibits in evidence that MACTEC properly protected the DGT with erosion control methods during construction. Accordingly, there is no evidence that the silt discovered in the DGT's sumps resulted from inadequate silt fencing.

371. Upon determining there was siltation or some obstruction in the sumps, MACTEC, through its Portland engineers and field personnel, determined that MACTEC needed to clear the sumps of whatever obstruction was in the sumps by "developing" them. (Tr. 8/30/07, 89: 7-21.) The phrase "develop the sumps" means to surge water through the sumps to clear out obstructions. (*Id.*; 89:22-90:9) Any new groundwater well or sump needs to be developed by surging water in and out to wash fine materials out of the well and out of the screen of a well to get a good flow of water. (Tr. 9/4/07, 41:20-42:7.) After the silt was identified in the sumps, MACTEC began developing a work instruction package to remove the silt in the sumps. (Tr. 8/30/07, 92:13-23; Pl. Ex. 373, Vol. 35.) As early as August 16, 2004, MACTEC prepared a work instruction for subcontractors to develop the sumps. (*Id.*; 90:20-92:5; Pl. Ex. 393, Vol. 35.)

372. After developing its work instruction package, MACTEC met with BJC to determine if the package was satisfactory to BJC. (Tr. 8/30/07, 92:13-23.) This meeting occurred on or about October 28, 2004. (*Id.*; Pl. Ex. 399, Vol. 36.) During the meeting, BJC's representative Lou Tanner stated that BJC was not concerned about the technical competence of the work instruction to develop the sumps. (Tr. 8/30/07, 94:2-95:3.) Instead, BJC stated that BJC expected the trench itself to be free of silt and criticized MACTEC's proposed work instruction package because it did not guarantee that the trench was free of any silt. (Tr. 8/30/07, 95:16-96:7; Pl. Ex. 399, Vol. 36.) BJC's other representative at the

meeting, Dick Ketelle, also stated that BJC wanted proof that the trench itself was free of silt. (Tr. 8/30/07, 97:1-4; Pl. Ex. 399, Vol. 36.)

373. During this time, MACTEC continued to request the opportunity to clean the sumps and operate the downgradient collection system by running the collected DGT water through the WTF as the Subcontract contemplates and expressly provides. (Tr. 8/30/07, 99:1-21; Pl. Ex. 400, Vol. 36.) BJC readily acknowledges that throughout the entire duration of the dispute surrounding the presence of silt in the sumps, MACTEC maintained its position that the appropriate way to address the issue and determine what, if any, modifications needed to be made was through operation of the DGT and WTF. (Tr. 9/5/07, 122:6-24.) However, in an effort to placate BJC's demands to have a silt-free DGT, MACTEC internally began outlining a pumping test in October 2004. (Tr. 8/30/07, 174:5-9.)

374. In a letter dated October 22, 2004, MACTEC reiterated to BJC that MACTEC wanted to operate the DGT and WTF so that it could determine whether silt was in the DGT and what adjustments, if any, needed to be made. (Tr. 9/5/07, 134:11-17; D. Ex. 110.)

375. On October 28, 2004, MACTEC sent to BJC a letter restating MACTEC's position that BJC's rejection of the work instruction to develop the sumps would have an impact on MACTEC's ability to start up the WTF. (Tr. 8/30/07, 97:8-98:25; Pl. Ex. 400, Vol. 36.) MACTEC could not operate the WTF or DGT without first developing the sumps. (Tr. 8/31/07, 201:7-21.) Without BJC providing approval to develop the sumps, MACTEC could not develop the sumps and, in turn, could not operate the WTF and the DGT. BJC rejected the work instruction to develop the sumps because BJC contended

“the planned work to clean the sumps would not ensure that the interceptor trench itself was clear of any silt....” (Pl. Ex. 400. (emphasis added)) At trial, BJC’s Spurling admitted that demonstrating that the DGT is free of silt was “impossible.” (Tr. 9/5/07 124:4-9.)

376. BJC knew that once the DGT was covered by the cap, it was impossible to demonstrate from a technical standpoint that the 1,200-foot DGT was free of silt. (Tr. 9/5/07, 124:4-9.) Nevertheless, BJC directed MACTEC to prove that the DGT was free of silt before it would allow MACTEC to operate the DGT or WTF. (Tr. 9/5/07, 123:7-9)

377. In December 2004, MACTEC’s Billy Reid met with BJC’s Charlie Johnson, Manager of Projects for Melton Valley, to discuss coordination issues regarding the WTF startup and operation as well as other Project issues. (Tr. 8/27/07, 129:11-20; Pl. Ex. 428, Vol. 36.)

378. Reid requested during this meeting that BJC participate in the development of the sumps. (Tr. 8/27/07, 130:14-20.) BJC did not participate. *Id.* (Tr. 8/30/07, 103:19-104:25; Tr. 8/27/07, 131:6-12; Pl. Ex. 428, Vol. 36.) MACTEC actually developed the sumps around Thanksgiving of 2004 into early December, 2004. (Tr. 8/30/07, 100:5-13; Pl. Ex. 412.)

379. Despite MACTEC’s consistent position that it should be allowed to operate the DGT and WTF, BJC descoped the treatment facility before MACTEC could operate it. (Tr. 9/5/07, 161:6-11; Tr. 8/27/07, 175:4-20.) BJC repeatedly informed MACTEC that BJC would not approve cleaning the sumps in the DGT unless MACTEC performed a pumping test. (Tr. 8/30/07, 164:11-19.) Cleaning of these sumps was necessary to start and operate the collection system (DGT and WTF) so as to make adjustments to the as-installed System. (Tr. 8/30/07, 98:8-25.)

380. On January 5, 2005, the parties met again and MACTEC reiterated its desire to operate the DGT and WTF. (Tr. 8/30/07, 107:116-109:10; Pl. Ex. 435.) In that meeting, MACTEC and BJC discussed the development of a test plan for the DGT. (Tr. 8/30/07, 109:19-23; Pl. Ex. 439, Vol. 36.) MACTEC and BJC were to work together to generate the plan. (Tr. 8/30/07, 110:7-10.) In the January 5, 2005 meeting, BJC acknowledged that the WTF was ready to start up. (Tr. 9/5/07, 139:16-140:22; Pl. Ex. 551, Vol. 41.)

381. On January 10, 2005, MACTEC wrote a letter to BJC summarizing the parties' agreement that the WTF was ready to be operated. (Tr. 9/5/07, 141:11-21; Pl. Ex. 439, Vol. 36.) BJC informed MACTEC that BJC wanted MACTEC's pumping test plan no later than January 18, 2005. *Id.*

382. On January 12, 2005, merely one week after the parties' agreement, BJC issued a letter to MACTEC directing MACTEC to stop work on the test plan and directing MACTEC to perform a pumping test that BJC developed. (Tr. 8/30/07, 111:14-112:13; Pl. Ex. 440, Vol. 36; Pl. Ex. 439, Vol. 36; Tr. 9/5/07, 142:13-19.) This very same letter dated January 12, 2005 also descoped the operation of the WTF from MACTEC's Scope of Work. (Tr. 8/30/07, 113:5-11; Pl. Ex. 440, Vol. 36; Tr. 9/5/07, 144:1-8.) BJC had determined internally that it wanted to change the method by which the downgradient collection system was to be operated for the purpose of adjusting and "tweaking" the system by a series of pump tests, rather than through the operation of the DGT and WTF as specifically set forth in the Subcontract. BJC acknowledged that by electing this change, it would save in excess of \$200,000 in funds that would otherwise be paid to MACTEC to operate the WTF as required by the Subcontract, and approximately \$1,000,000 in savings

because by directing that the WTF not be operated, BJC would save what it called the substantial costs of decontaminating and mothballing a contaminated WTF, rather than mothballing an uncontaminated WTF. (Tr.9/5/07, 175:15-176:8.)

383. In an email transmittal dated February 1, 2005, BJC provided information regarding its pumping test (Tr. 8/30/07, 115:13-25, 116: 1-17; Pl. Ex. 449, Vol. 36.) BJC required MACTEC to “strictly” implement BJC’s directed pumping test. (Tr. 9/4/07, 170:6-10.) In this email, BJC also states that BJC intended to “eventually pass this along” to MACTEC as additional contract work. (Tr. 8/30/07, 116:16-117:5; Pl. Ex. 449, Vol. 36.) Accordingly, MACTEC expected to be paid for this additional work. *Id.*

384. Ultimately, BJC provided MACTEC the work instructions to perform the first DGT pumping test. (Pl. Ex. 450, Vol., 36, Tr. 8/30/07, 121:6-22.)

385. On, March 3, 2005, MACTEC sent to BJC an email stating that the only criteria that the DGT was to meet was to show that there was an inward gradient to the DGT from the downgradient side of the DGT. (Tr. 8/30/07, 122:19-123:20; Pl. Ex. 462, Vol. 36.)

386. MACTEC could not determine if the silt in the sumps had any impact on the DGT’s performance without first turning the system on and operating it per MACTEC’s O&M Plan (Tr. 8/31/07, 210:16-211:11.) The monitoring data obtained from the start-up and operation of the DGT and the WTF would provide definitive guidance on the silt’s impact, if any, on the DGT. *Id.* But MACTEC could not obtain that monitoring data without first developing the sumps, installing the pumps into the sumps and then turning on the System. (*Id.*; Tr. 8/31/07, 201:7-21.) After the operation of the DGT was descoped on January 12, 2005, and BJC elected to unilaterally change the method of determining

whether the downgradient collection system needed adjustments or modifications, BJC never entertained any further requests of MACTEC to operate the DGT and WTF although MACTEC continuously requested the opportunity to do so. (Tr. 9/5/07, 122:6-25.)

E. MACTEC Did Not Cede Control To BJC

387. BJC asserts that MACTEC was unwilling to proceed with any corrective action respecting the DGT and thus breached the requirements of the Subcontract. Pursuant to General Condition GC-31, BJC was then authorized to proceed with correcting MACTEC's alleged defective and nonforming work and to backcharge MACTEC for the costs incurred.

388. BJC asks this Court to find that MACTEC "ceded" control over the means and methods of performing its work and elected to "cede the field" to BJC. However, the evidence stands in stark contrast. For months, MACTEC requested authorization from BJC to develop the sumps so that it could commence operation of the WTF and DGT. For many months, BJC refused to allow MACTEC to proceed with the sumps' development, insisting that MACTEC produce a plan to demonstrate that the DGT trench itself, in its entirety, was free of silt. This was a technical impossibility, as conceded by Robert Spurling at trial. (Tr. 9/5/07, 124:4-9). Thereafter, once the sumps were developed, MACTEC continued to develop a testing procedure that would satisfy BJC and was afforded until January 18, 2005 to do so. However, by letter dated January 12, 2005 "MACTEC was directed to implement the work instructions that were provided to them by Bechtel Jacobs to conduct the pump tests.... it was strictly conducting the pump tests and turning the data over to Bechtel Jacobs." And, as BJC acknowledges in its January 12,

2005 letter, to “[t]he extent, if any, MACTEC had begun developing its own pump test following the meeting held on January 5, 2005, BJC directed that this effort end.” BJC’s January 12, 2005 letter directed MACTEC to stop work on the test plan and directed MACTEC to perform a pumping test that BJC developed. (Tr. 8/30/07, 111:14-112:13; Pl. Ex. 440, Vol. 36; Pl. Ex. 439, Vol. 36; Tr. 9/5/07, 142:13-19.) In this very same letter BJC descoped the operation of the WTF from MACTEC’s Scope of Work (Tr. 8/30/07, 113:5-11; Pl. Ex. 440, Vol. 36; Tr. 9/5/07)

389. Any contention or suggestion that MACTEC “ceded” control over its work or testing is belied by the evidence. It is clear that BJC had determined internally to change the method by which the downgradient collection system would be operated for the purpose of adjusting and tweaking the system through BJC-designed pump tests, rather than the operation of the WTF and DGT as provided by the Subcontract. It was undisputed at trial that MACTEC unwaveringly maintained its position that the appropriate way to address the silt issue was to operate the WTF and DGT as the Subcontract contemplated and provided. (Tr. 9/5/07, 122:6-24). BJC’s contention that MACTEC “ceded the field” and forfeited control over the DGT is meritless.

F. BJC’S Decision to Descope the Operation of the DGT and WTF

390. Instead of allowing MACTEC to operate the WTF, BJC decided to use a centralized water treatment facility that would treat the water collected in the DGT. (Tr. 9/5/07, 128:5-12.)

391. BJC made the decision to mothball the WTF and start the design of the new centralized water treatment plant in the Spring of 2003. (Tr. 9/4/07, 157:5-6; Tr. 9/6/07, 124:8-22.) Frank Cater arrived in 2003 to design the new water treatment facility. *Id.*

392. BJC was in the process of collecting bids from various subcontractors to do the piping work on the centralized water treatment facility sometime in October 2004. (Pl. Ex.7J, Vol. 3.)

393. Robert Spurling initially testified that as of October 18, 2004, BJC had not determined whether to descope MACTEC's WTF. (Tr. 9/5/07, 131:12-15.) Spurling then testified, however, that the decision to mothball the SWSA 4 treatment plant had occurred well before October 2004. (Tr. 9/5/07, 132:12-22.) On January 5, 2005, Spurling acknowledged that there were no outstanding issues that would prevent the operation of the WTF. (Pl. Ex. 551; Tr. 9/5/07, 139:16-140:22.) However, within one week of that acknowledgment, BJC descoped the operation of the WTF from MACTEC's scope of work. (Tr. 9/5/07, 144:1-8; Tr. 8/27/07, 174:4-16; Pl. Ex. 7Q, Vol. 3.) Spurling later testified that by descoping the WTF from MACTEC's scope, BJC would save well over \$1.2 million in costs associated with paying MACTEC to operate the WTF and then mothballing a contaminated system. (Tr. 9/5/07, 175:15-176:8.)

394. BJC did not inform MACTEC that BJC planned to mothball MACTEC's constructed WTF until January 12, 2005. (Tr. 9/5/07, 144:1-4.)

395. BJC knew as early as the Spring of 2003 that it was going to mothball MACTEC's constructed WTF and, instead, construct a centralized WTF to treat groundwater collected in the DGT. (Tr. 9/4/07, 157:5-6; Tr. 9/6/07, 124:8-22.)

396. Water collected in the DGT was pumped to a centralized facility starting on November 18, 2005. (Tr. 9/5/07, 129:2-7.) There was no water treatment facility of any type able to accept contaminated water collected at SWSA 4 until the fall of 2005. (Tr. 9/5/07, 129:8-13.) Accordingly, from the time when BJC descoped the WTF from MACTEC's Scope of Work on January 12, 2005, through November 18, 2005, it was impossible for MACTEC or anyone to run the DGT as designed, or otherwise. (Tr. 9/5/07, 129:2-13; Tr. 8/27/07, 174:19-175:3.)

397. By descoping the WTF, BJC rendered MACTEC's ability to meet its Subcontract requirement to operate and maintain the System impossible. (Tr. 8/27/07, 176:1-8; Tr. 9/4/07, 29:5-16.)

G. BJC'S First Pumping Test

398. On January 12, 2005, MACTEC was directed by BJC to perform a test "to demonstrate that the DGT has been constructed in accordance with the Subcontract requirements." (Pl. Ex. 446, Vol. 36; Tr. 9/4/07, 169:21-170:12.) BJC directed MACTEC to do the first pumping test to evaluate the DGT's performance and ability to meet its intended objective. (Pl. Ex. 480, Vol. 37, p. 12.) BJC's first pumping test was designed by BJC. (Pl. Ex. 476, Vol. 37, p. SWSA000508.) As noted previously, the first pumping test followed BJC's January 12, 2005 directive to MACTEC to: (a) stop developing tests; (b) descope the operation of the WTF from MACTEC's scope; and, (c) implement a test program to be designed by BJC. (Pl. Ex. 440, Vol. 36.)

399. Work instructions for the first pumping test were issued in May 2005 and the field work completed by June 1, 2005 (Pl. Ex. 472, Vol. 37.).

400. MACTEC's design anticipated that the pumps located in the DGT would pump at a constant rate. (Tr. 8/31/07, 204:13-21; Joint Ex. 1, Mitchell Dep. 179:5-19.)

401. BJC's first pumping test used very high pumping rates over a short pumping duration. (Tr. 8/31/07, 212:24-213; Tr. 9/6/07, 11:1-20.)

402. BJC's first pumping test results show that there was a fairly substantial draw down in the pumped sums and a response in the other trench segments' sums in each trench segment at all piezometer locations. (Tr. 8/31/07, 215:5-216:25.) The pumping test also showed the development of an inward gradient at the installed piezometers. *Id.*

403. Dr. Shanahan evaluated the results of BJC's first pumping test. Dr. Shanahan concluded that the pumping test showed there was draw down along the length of the trench, that he could observe a change in the water level along the trench, and that the water in the DGT continued to drop after the test was terminated. (Tr. 9/4/07, 42:14-43:17.) However, Dr. Shanahan concluded that the BJC-designed first pumping test was simply too short of a duration to evaluate the long-term performance of the DGT. *Id.* Nevertheless, the limited pumping data showed that the DGT was meeting the performance criteria and creating an inward gradient into the DGT from the downgradient side of the DGT. *Id.*

404. Although one of the purposes of BJC's first pumping test was to aid in determining the path forward regarding making the DGT operational, BJC's Michael Sholley testified that BJC's first pumping test data did not aid BJC in determining the path forward. (Pl. Ex. 480, Vol. 37, p. 18; Tr. 9/6/07, 11:12-20.) Sholley's task was to issue an opinion on the first pumping test data to determine the permeability values that were calculated based upon that data. (Tr. 9/6/07, 45:12-22.) He testified that the first pumping test data

was highly variable and made it very difficult to do an accurate analysis. (Tr. 9/6/07, 45: 12-20, 46:10-16.)

H. BJC'S Presentation to the Regulators

405. After the first pumping test, BJC informed the regulators in a June 9, 2005 meeting that the DGT would not operate. (Tr. 9/5/07, 176:14-177:7, 177:20-178:10.) In a June 9, 2005 PowerPoint presentation to the regulators, BJC proposed installing a new DGT either upgradient or downgradient of the existing DGT as an option to correct the alleged "defective" DGT. (Pl. Ex. 480, Vol. 38.)

406. BJC did not inform MACTEC of the June 9, 2005 meeting. (Tr. 8/27/07, 134:10-24; Tr. 9/5/07, 145:5-19.)

407. MACTEC learned about the June 9, 2005 meeting the day before the meeting. (Tr. 8/27/07, 134:10-24; Tr. 9/5/07, 145:5-19.)

408. MACTEC asked to attend the June 9, 2005 meeting or for BJC to at least postpone the meeting. (Tr. 8/27/07, 135:1-15; Tr. 9/5/07, 145:5-22; Pl. Ex. 511, Vol. 38, Resp. to Req. for Admis. No. 29, Bates PX0511.0007.) BJC denied MACTEC's request. (Tr. 8/27/07, 135:12-20; Pl. Ex. 511, Vol. 38, Resp. to Req. for Admis. No. 29, Bates PX0511.0007.)

409. Shortly thereafter, BJC informed the regulators that the DGT was defective and likely needed to be replaced in its totality and that BJC had plans in place to exhume portions of the trench. (Tr. 9/5/07, 176:14-178:10; Pl. Ex. 15, Vol. 11, Meeting Minutes July 13, 2005 Bates 61367-61378.)

I. BJC's Second Pumping Test

410. BJC assigned Sholley the task of evaluating the first pumping test data and developing a scope of work for a second pumping test. (Tr. 9/6/07, 11:1-6.)

411. BJC designed the second pumping test to measure gradients from the IHP. *Id.* Sholley cannot recall who told him that the DGT was to have an inward gradient from the IHP. (Tr. 9/6/07, 52:13-23, 53:22-54:2.) Nevertheless, the second pumping test was constructed to show an inward gradient from the IHP to the DGT, not an inward gradient at the downgradient side closest to the DGT. (Tr. 9/6/07, 37:1-7.)

412. The second DGT pumping test was carried out in October and November of 2005 (Pl. Ex. 500, Vol. 38; Tr. 9/6/07, 110:4-18; Tr. 9/4/07, 212:11-17.) The motivation for the second test was provided in a technical memorandum. (Tr. 8/31/07, 218:2-219:16; Pl. Ex. 485, Vol. 37, pg. 13.) According to that document, BJC Engineering had determined that additional testing performed in each trench segment consisting of longer term constant rate tests with additional monitoring points in and between trench segments and the IHP would provide additional information on response within the trench segments and performance when compared to MACTEC's design. *Id.*

413. BJC's second pumping test differed from its first pumping test in two ways: (1) it pumped from the single sumps for a longer duration and collected more data points because forty-four new piezometers were installed, and (2) BJC also placed four pumps into each trench segment and pumped from all four pumps at one time. (Tr. 8/31/07, 219:17-220:23; Tr. 9/6/07, 18:3-7.) The results of BJC's second pumping test while pumping from only one pump per trench segment showed that there were some locations that did not show inward gradients. *Id.* The results of BJC's second pumping test when all

four pumps were pumped per trench segment showed that inward gradients were established along the entire trench segment. *Id.* Based upon its second pumping test, BJC reached the same conclusion that BJC's expert Dr. Pinder reached within only two hours of his initial consideration: additional pumps in each trench segment would create the requisite inward gradient. (Tr. 9/6/07, 80:12-81:3, 13-16; Tr. 8/31/07, 222:16-20; Tr. 9/6/07, 21:9-21.)

414. During the second set of pumping tests, individual sums were pumped in each trench segment for a period of three or more days. (Pl. Ex. 499, Vol. 38, BJC SWSA4-61250.) The groundwater model described by BJC that was supposed to be used in interpretation of the model results and for prediction of long-term trench performance has not been described in any reports made available for MACTEC's review. (Pl. Ex. 518, Vol. 41, Bates PX0518.0010.) BJC's Sholley testified that this model was not necessary in determining the ultimate adjustments made by BJC to the DGT. (Tr. 9/6/07, 55:20-56:19.)

415. During BJC's pumping tests over nearly the entire period of active pumping, inward gradients were measured at each of the three piezometer pairs. (Tr. 8/31/07, 233:14-20; Tr. 9/4/07, 42:14-25, 45:6-46:5.) Dr. Shanahan evaluated BJC's second pumping test. (Tr. 9/4/07, 44:6-12.) The second pumping test's results indicated that the test was too short of a duration to evaluate the long-term performance of the DGT. (Tr. 9/4/07, 45:10-12.) Nevertheless, Dr. Shanahan observed that the DGT created an inward gradient to the DGT along most of the monitoring points as designed. (Tr. 9/4/07, 45:19-24.)

416. BJC's expert, Dr. Pinder, took only 2 hours of investigation and consideration to determine that the DGT required additional pumps. (Tr. 9/6/07, 80:12-81:3,

81:13-16.) Dr. Pinder referred to BJC's DGT first and second pumping tests as "experiments." (Tr. 9/6/07, 66:2-8.)

417. MACTEC would have achieved the same monitoring data as that collected in both pumping tests, if not better information, during the start-up phase of the DGT and WTF had it been allowed to operate the DGT and WTF in accordance with the Subcontract. (Tr. 9/4/07, 59:6-21; Tr. 8/31/07, 217:10-21.) MACTEC's five-month operation period constitutes, in essence, a five-month trench test, as opposed to BJC's short duration trench test. (Tr. 9/4/07, 59:6-21.) It would have only taken MACTEC "a few days" to obtain this same information gathered in BJC's "experiments." (Tr. 8/31/07, 217:22-218:1.) Had BJC not changed the process to monitor and test the DGT in order to determine what, if any, adjustments needed to be made and for the purpose of saving in excess of \$1.2 million, MACTEC would have gathered the same data and reached the same conclusions as that reached by BJC through its multiple "experiments".

418. BJC is currently monitoring the DGT using MACTEC's O&M Plan, with minor modifications. (Doc. 102, Ketelle Dep. 55:15-56:10.)

J. BJC's Modifications

419. Although BJC claimed the presence of silt as the primary defect in the as-installed DGT, BJC did nothing to remove the alleged silt in the DGT. (Tr. 9/6/07, 122:9-14; Pl. Ex. 511, Vol. 38, Resp. to Req. for Admis. No. 82, Bates PX0511.0015.) However, BJC had insisted that in order for MACTEC to proceed with developing the sumps, MACTEC had to commit to make the DGT "silt free." (Tr. 8/30/07, 228:22-229:21; Pl. Ex.

399, Vol. 36; Tr. 9/5/07, 123:2-9.) BJC admits that it is technically impossible to demonstrate that the DGT is silt free. (Tr. 9/5/07, 123:22-25.)

420. BJC admits that MACTEC was contractually entitled to “five months to ‘tinker’ with the system”. (D. Ex. 221, pg. 2.) It was this “tinkering” that MACTEC consistently requested the opportunity to perform from November 2004 through 2005 through the operation of the DGT and WTF. (Tr. 9/5/07, 122:6-25.)

421. Following the second round of pumping tests, BJC undertook a set of “corrective” actions. (Pl. Ex. 500, Vol. 38.) These actions included:

- construction of one additional sump at the south end of trench A and one at the north end of trench C;
- deepening of all sumps by 2 to 3 feet (recognized as system “enhancements” not chargeable to MACTEC);
- installation of pumps within all 14 sumps; and,
- upgrading of electrical system and conveyance piping between sumps.

Id.

422. After its adjustments to the DGT, BJC did not operate the SWSA 4 WTF through one wet season – November through March – before obtaining the regulators’ approval of the DGT. (Tr. 9/6/07, 123:16-22; Tr. 9/5/07, 121:8-17.) In fact, BJC started pumping the DGT in February, 2006, more than three months into the five month wet season. (Tr. 9/6/07, 125:20-23.)

423. BJC installed two additional sumps as part of the DGT’s “fix.” (Tr. 9/6/07, 122:15-18.)

424. BJC added eleven additional pumps as part of the adjustments to the DGT. (Tr. 9/6/07, 122:19-21; Tr. 9/4/07, 63:1-12.)

425. The addition of the extra pumps and sumps did not change the flow of water being generated from the System and treated. (Tr. 9/4/07, 87:8-25.)

426. The pumps added by BJC cost approximately \$500 each. (Tr. 9/6/07, 49:17-19.) The ultimate “fix” to the System was not a design change and it did not require regulatory approval. (Pl. Ex. 15, Vol. 11, *ad hoc* meeting minutes dated December 13, 2005; Tr. 9/5/07, 159:11-20.) BJC’s adjustments to the DGT did not require an addendum or revision to the RDR/RAWP since the adjusted DGT was meeting the performance objectives of the ROD. (Tr. 9/5/07, 160:20-161:2.)

427. BJC added electrical wiring in the DGT as part of the corrective measure regarding the DGT. (Tr. 9/6/07, 122:19-25.) Other than adding two new sumps, eleven new \$500 pumps and rewiring these pumps, BJC did not alter, physically, the DGT as installed by MACTEC. (Tr. 9/6/07, 123:1-15.)

428. Although BJC identified silt as a primary defect of the DGT, BJC does not know if there is, or was, any actual silt in the DGT. (Tr. 8/31/07, 257:17-22; Tr. 9/6/07, 119:16-23.)

429. BJC had several options available to it to determine the actual amount of silt in the DGT. (Tr. 9/6/07, 120:4-9.) These options included: (1) digging up the trench, (2) taking rotosonic probes of the DGT, (3) using ground penetrating radar, and (4) performing an electromagnetic survey. (Tr. 9/6/07, 120:4-121:12.) BJC did not take advantage of any of these available options to determine the actual quantities of silt allegedly located in the DGT. *Id.*

430. The DGT, after BJC’s “fixes,” was essentially the same design as MACTEC’s design. (Tr. 9/4/07, 84:11-18.)

431. The DGT satisfied the regulators and was approved with BJC's modifications to the DGT. (Tr. 9/6/07, 123:19-24.)

432. The corrective measures taken by BJC did not remove silt material from the DGT, only the sumps. (Tr. 9/6/07, 123: 7-12; Pl. Ex. 511, Resp. to Req. for Admis. Nos. 82 and 84, Bates PX0511.0015-0016.)

433. BJC did not remove any siltation from the DGT. (Pl. Ex. 511, Vol. 38, p. 15, Resp. For Req. Admis. No. 82, Bates PX0511.0015.)

434. Despite allegedly having silt in the DGT, BJC was still able to capture drawdowns along the entire length of the DGT. (Tr. 9/6/07, 123: 16-24; Tr. 9/4/07, 83: 7-16.) The identified silt in the DGT or the sumps was easily corrected by adding a few pumps and sumps. (Tr. 9/4/07, 83: 7-16.)

435. BJC only made minor adjustments to the DGT to obtain regulator approval. (Tr. 9/5/07, 159:3-161:2.)

436. During the course of April through July 2006, BJC pumped 2.5 million gallons of water from the SWSA 4 DGT that was not discharged into the IHP as MACTEC's design required. (Tr. 9/6/07, 126: 9-12; Pl. Ex. 14, Vol. 40.) Instead, the water collected from the DGT is now being pumped to an off-site centralized water treatment facility for treatment. (Tr. 9/6/07, 126: 13-17.)

437. The higher the IHP's water table, the easier it would be for MACTEC to achieve its objective demonstrating an inward gradient per its design. (Tr. 9/6/07, 126:13-127:10; Tr. 9/4/07, 28:14-29:16.) The lower the IHP's water table, the more difficult it would for MACTEC to achieve its objective demonstrating an inward gradient per its design. *Id.*

438. The water collected in the SWSA 4 trench is not being discharged into the IHP currently. (Tr. 9/6/07, 126: 13-17.)

K. BJC Leak Tests

439. BJC did not discover that there was a potential issue with water from external sources infiltrating the DGT until after it turned the System on and began to monitor its performance. (Tr. 9/4/07, 174:5-175:24.)

440. BJC performed several leak tests at locations off the capped area of the Project site. (Tr. 9/6/07, 116: 5-12; D. Ex. 320; Pl. Ex. 514, Vol. 40.) According to Frank Cater, BJC's lead engineer overseeing the SWSA 4 "corrective" work, seven of the ten leak tests were found to be inconclusive and were directed at potential water sources outside of the cap. (Tr. 9/6/07, 114: 6-14; Pl. Ex. 514, Col. 40.)

L. MACTEC Is Not Liable For BJC's Leak Tests, Geophysical Tests, Or Dye Tests

441. BJC urges the court to charge MACTEC with costs allegedly incurred by BJC to determine and arrest the source of water infiltration into the DGT emanating from areas outside of the capped area. However, BJC correctly notes in its Findings of Fact that the Subcontract's Scope of Work at Section 2.3.3 only requires that the DGT "is to collect contaminated groundwater from the capped area [of SWSA4], preventing discharge [of contaminated water] to local surface water."

442. BJC conducted off-cap tests to locate water sources that were all beyond the capped area. (Tr. 9/6/07, 114: 6-12; Pl. Ex. 514, Vol. 40) During his testimony,

Frank Cater plotted the approximate location of each test, all of which were outside the capped area. (Tr. 9/6/07, 110:1–25.)

443. BJC surmised that water from locations beyond the capped area were infiltrating the DGT only after it began operating the System during the May 2005 pump test. Ultimately, BJC concluded that these tests were mostly inconclusive. In fact, BJC was not able to establish a direct link with the DGT and the leak tests. (Tr. 9/6/07, 115:20–25.)

444. The court finds that MACTEC is not liable to BJC for the costs it incurred to conduct these inconclusive leak tests, dye tests, and geophysical tests. It was MACTEC's contractual responsibility to install a DGT that would collect groundwater from the capped area. MACTEC had no obligation to install a DGT that would collect surface water or groundwater from beyond the capped area. Further, I find that BJC discovered the "bathtubbing" issue within the DGT after it began operating it. If MACTEC would have been allowed to operate the System as it repeatedly requested, it likely would have discovered the leaks and would have been properly paid for this work as extra work under General Conditions GC-18 and GC-20, because the sources of the leaks were outside of the cap, and thus outside of MACTEC's Scope of Work.

445. I further find that the relative failure of BJC's subsequent geophysical studies suggest that the hidden – and still yet to be discovered – water pathways were not easily located or planned adequately for by BJC. Further, BJC denied MACTEC the opportunity to conduct pre-bid intrusive investigations that may have identified the source of the leaks during design. Nevertheless, I find that MACTEC reasonably relied upon the geotechnical information BJC provided to design and install the various components of the

System, including the DGT. Thus, BJC is contractually charged with the costs arising out of any pre-existing site condition that may lead to the introduction of surface or groundwater from beyond the capped area. See Special Condition SC-36.

IV. CONCLUSIONS REGARDING THE DGT

446. I find that MACTEC should have been allowed to develop the sums and operate the System to determine if silt would impact its performance. I find that operating the WTF in concert with the DGT was critical to MACTEC's design because discharged and treated water collected from the DGT into the IHP would have an impact on the System's ability to meet its performance criteria. (Tr. 9/4/07, 28:14-29) According to Dr. Shanahan, the DGT was designed to create an inward hydrologic gradient from the downgradient side of the DGT. (*Id.*; Joint Ex. 1, Mitchell Dep. 89:16-90:15.) I find that if MACTEC achieved a higher water elevation in the IHP, due to the addition of water into the IHP from the WTF and other surface sources, then the achievement of a hydraulic gradient into the DGT would be "much more likely." (Tr. 9/4/07, 28:14-29:16.) As Dr. Shanahan concluded, "if that water level is lowered because you don't have this extra water coming in, then that design goal is much harder to meet." *Id.* BJC rendered the foregoing impossible by descoping the operation of the WTF which would have deposited treated water into the IHP, thus requiring less drawdown in the DGT in order to maintain an inward gradient.

447. I find that BJC's non-operation of the WTF had two impacts upon the System's operation. (Tr. 9/4/07, 28:14-29:16.) First, there would not be any additional clean treated water introduced into the IHP. *Id.* MACTEC's design was based on clean, treated water being pumped into the IHP to help meet the Subcontract's ambient water quality criterion. *Id.* Second, because there would be no clean, treated water discharged from the WTF into the IHP, there would be a lower hydrologic head (water table) downgradient of the DGT which would make the capture of groundwater much more difficult to achieve in the DGT. *Id.*

448. I find that MACTEC had fully intended to adjust pumping set-point elevations in response to measured water elevations so as to achieve the design objective of inward flow along the length of the DGT. (Tr. 8/31/07, 204: 13-25; Pl. Ex. 108, Vol. 27.)

449. I find that had MACTEC been given the opportunity to operate the DGT and WTF, the set-point elevations would have been adjusted (along with other potential modifications) to ensure that inward flow was achieved along the length of each trench segment. (*Id.*; Pl. Ex. 518, Vol. 41, pg. 14; 18; Tr. 9/4/07, 61:5-62:21; Pl. Ex. 514, Vol. 40.) I find that MACTEC could have gained information about the character of the as-installed DGT by simply operating the DGT and WTF System. (Tr. 9/4/07, 59:2-60:19; Tr. 8/31/07, 259: 4-14.)

450. I find that MACTEC would have likely implemented adjustments to the DGT similar to those BJC made had MACTEC been allowed to operate the System. (Tr. 9/4/07, 65: 1-18.) MACTEC would have likely added additional monitoring, added more piezometers and added additional sumps and/or pumps. *Id.*

451. I find that a prudent approach for resolution of concerns related to the presence of sediment or silt in the DGT would have been to allow the DGT to function under the proposed normal operating conditions, to observe water levels within and outside the trench over an extended period, and to incrementally improve the trench performance. (Tr. 9/4/07, 67: 2-22.) MACTEC should have been allowed to clean out the sumps so that it could operate the System and obtain the monitoring information specified in the O&M Plan. *Id.* I find that this would have allowed for the incremental testing and resolution of problems in trench performance. *Id.* I find that this would have afforded MACTEC the opportunity to observe water levels, install additional piezometers as necessary, and make modifications to the DGT to ensure that the trench met the design objectives. (Tr. 9/4/07, 37: 12-20.)

A. REA 65 - DGT Test

452. MACTEC seeks compensation for performing the first pumping test as directed and designed by BJC. (Tr. 8/29/07, 31:19-32:11.)

453. MACTEC was directed to implement the work instructions provided by BJC to conduct the first pumping test on the installed DGT. (Pl. Ex. 480, Vol. 37, p. 12; Pl. Ex. 446, Vol. 36; Tr. 9/4/07, 169:21-170:12.) BJC unilaterally made this change to the procedure to make adjustments to the DGT from operating the DGT and WTF as provided in the Subcontract, to incremental BJC-designed testing, or as Dr. Pinder calls them "experiments". (Tr. 9/7/07, 66: 2-14.)

454. Graphs of the first pump test in May 2005 show an inward gradient from the IHP into the DGT. (Tr. 9/5/07, 153:15-154:22.)

455. MACTEC notified BJC that the pumping tests were outside its scope of work. (Pl. Ex. 7N, Vol. 3.) Further, MACTEC requested payment for its additional services if the pumping tests demonstrated the System met the Subcontract performance criteria. (Tr. 8/29/07, 32: 8-19.)

456. BJC later determined that the first pumping test produced unreliable information. (Tr. 9/6/07, 46: 10-16, 45: 12-20.) To calculate REA 65, MACTEC included costs from Miller Government Services for its performance of the BJC-directed pump test (Tr. 8/29/07, 32:20-33:25; Pl. Ex. 7, Vol. 3.) MACTEC also included the hours report for the Project Manager and the Controls Engineer during the BJC-directed pump test as reflected in the Oracle cost report. *Id.* Finally, MACTEC included its actual E&C costs incurred. *Id.*

457. I find that MACTEC is entitled to \$228,930.46, exclusive of interest, for REA 65. (Pl. Ex. 7, Vol. 3.)

458. I find that MACTEC is entitled to interest beginning July 18, 2007, the date MACTEC submitted its claim to BJC. (Pl. Ex. 7, Vol. 3.)

459. Based on the foregoing, I find that MACTEC is entitled to \$10,411.63 in prejudgment interest, computed at ten percent *per annum*, on the \$228,930.46 awarded for REA 65 for the time period commencing July 18, 2007 through December 31, 2007, and is entitled to interest at the daily amount of \$62.72 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 7, Vol. 3.)

V. MACTEC's UNPAID SUBCONTRACT BALANCE

460. MACTEC's Subcontract price was increased by formal modifications to \$17,121,774.63. (Tr. 9/4/07, 110:25-111:1; Pl. Ex. 12, Vol. 5; Pl. Ex. 571.)

461. I find that MACTEC's total billings that were invoiced to BJC were \$16,652,452.56. (Tr. 9/4/07, 119: 13-19; Pl. Ex .12, Vol. 5; Pl. Ex. 571.)

462. BJC has paid to MACTEC \$13,888,112.64 for work performed on the SWSA 4 Project. *Id.*

463. MACTEC has a balance due representing retainage and unpaid Subcontract balance in the amount of \$2,726,398.20. (Tr. 9/4/07, 115: 2-9; Pl. Ex. 12, Vol. 5; Pl. Ex. 571.)

464. MACTEC's unpaid Subcontract balance and retainage of \$2,726,398.20 includes a credit to BJC in the amount of \$473,957.77¹ for the following unbilled amounts:

<u>Item</u>	<u>Description</u>	<u>Amount</u>	<u>Notes</u>
5	2.02 b SWSA 4 Cap	\$100,000.65	(1)
8	2.02 e Wetlands Restoration	47,035.70	(2)
12	2.02 I Downgradient Collection Trench	201,976.20	(3)
26	2.03 a RAR	54,971.00	(4)
27	2.03 b As-Built Drawings	473,957.77	(5)

¹

During the trial, MACTEC corrected a formatting error in its wetlands restoration credit. As a result, the formatting error increased the wetlands restoration credit by \$4,635.70. The increase of \$4,635.70 affects the following amounts contained in Pl. Ex. 571. Unbilled amount of pay item 2.02e wetlands restoration is increased from \$42,400.00 to \$47,035.70; total unbilled amounts is increased from \$469,322.07 to \$473,957.77; unpaid Subcontract balance and Retainage is decreased from \$2,731,033.95 to \$2,726,398.20.

Notes:

- (1) Uninstalled piezometers
- (2) Descoped portion of wetlands restoration
- (3) Descoped operation of water treatment facility
- (4) Undelivered RAR materials
- (5) Undelivered as-built drawings

(Tr. 9/4/07, 111:9-12; 19; Pl. Ex. 571.)

465. BJC has been reimbursed by DOE for all costs that it is claiming against MACTEC in the lawsuit. (Tr. 9/5/07, 106:19-23.) If BJC were ordered to pay MACTEC its full outstanding subcontract balance, BJC would be reimbursed that amount from DOE. (Tr. 9/5/07, 115: 15-20.)

466. I find that MACTEC is entitled to \$2,726,398.20, exclusive of interest, for unpaid Subcontract balance and retainage. (Pl. Ex. 517, Vol. 41.)

467. I find that MACTEC is entitled to interest beginning July 6, 2005, the date that MACTEC filed its Complaint against BJC. (Pl. Ex. 517, Vol. 41.)

468. On April 18, 2007, MACTEC filed its First Amended Complaint. (Doc. 63). In its First Amended Complaint at paragraph 52, MACTEC averred: "Pursuant to the Tennessee Prompt Pay Act of 1991, Tennessee Code Annotated §66-34-101, et. seq. ("Prompt Pay Act"), on February 16, 2007, MACTEC gave BJC written notice of intent to seek relief pursuant to the Prompt Pay Act." *Id.* BJC did not file an Answer with this Court in response to MACTEC's First Amended Complaint. Therefore, I find that MACTEC satisfied the Prompt Pay Act notice requirements.

469. Based on the foregoing, I find that MACTEC is entitled to \$678,985.20 in prejudgment interest, computed at ten percent *per annum*, on the \$2,726,398.20 awarded for the Subcontract balance and retainage for the time period commencing July

6, 2007 through December 31, 2007, and it is entitled to interest at the daily amount of \$746.96 from January 1, 2008 until the date judgment is entered. (Pl. Ex. 517, Vol. 41.)

VI. SUMMARY OF MACTEC'S DAMAGES

Subcontract Balance and Retainage		\$2,726,398.20
REA/SCN Description		
SCN 041 Work rules	\$ 4,700.00	
REA 050 Request Spill Supplies	8,498.54	
REA 051 Contaminated Water	64,551.52	
REA 052 Storm Damage	92,432.80	
REA 053 Delete Guard Shack	(2,400.00)	
REA 054 Haul Road Restrictions	0.00	
REA 055 CLA Violation	0.00	
REA 056 Pipe Abandonment	9,276.32	
REA 057 Piezometer Installation	126,090.98	
REA 059 Grass Seed Mix	44,526.00	
REA 060 Wetlands Restoration *	21,304.92	
REA 063 Weir Construction	91,059.80	
REA 064 Hoisting Procedure Change	6,823.54	
REA 065 DGT Test	228,930.46	
REA 066 Acceleration	101,654.71	
REA 069 Additional Vent Stone	814,585.00	
REA 071 Haul Weight Restrictions	475,786.29	
REA 073 UGT Excavation	26,371.62	
Contour Fill Overruns	3,010,661.48	
Extended Program Costs	<u>916,300.00</u>	<u>\$6,041,153.98</u>
Subtotal		\$8,767,552.18
Interest **		<u>1,076,767.64</u>
Total		\$9,844,319.82

* Credit is included in MACTEC's Subcontract balance claim. REA 60 consist solely of additional work.

** Interest through December 31, 2007.

470. The total of the REAs and Subcontract balance when combined with the Subcontract amounts paid to date are still less than the total costs incurred by MACTEC on the Project, less any profit. MACTEC has been paid \$13,888,112.00. MACTEC's unpaid Subcontract balance and retainage total \$2,726,398.20. MACTEC's REAs and other claims total \$6,041,153.98. If MACTEC were paid the entirety of these amounts, the total would be \$22,655,664.18. MACTEC's actual out-of-pocket costs on the Subcontract are \$31,991,000.00, exclusive of any profit. Thus, if MACTEC were paid all that it seeks herein, it will still have incurred out-of-pocket losses of \$9,335,335.82. (Pl. Ex. 571; Tr. 9/4/07, 116:4-117:25.)

471. BJC urges this Court to reject MACTEC's damages because it claims that MACTEC's damages are not properly substantiated. While MACTEC did in fact prove its damages with the requisite degree of certainty, BJC is estopped from complaining about MACTEC's damages because BJC's breaches of contract placed MACTEC in a position where it made it difficult to track its costs.

472. Joe DuPree, MACTEC's cost and scheduling expert, testified that a contractor working in a disruptive environment will not establish cost codes to capture changed work. (Tr. 8/31/07, 45:24 – 47:15.) Instead, the workers charge time that is associated with changed work to a pre-existing cost code. *Id.* It then becomes difficult to evaluate costs associated with an REA. *Id.*

473. BJC's directives, rejection of MACTEC's requests for time extensions, and acceleration directives created a disruptive environment whereby MACTEC had to accelerate its work under unusually severe weather conditions and work under a compressed schedule. (Tr. 8/28/07, 24:4-18; Tr. 9/5/07, 102:2-21; Tr. 8/28/07, 130:21-

131:1.) For a substantial period of time MACTEC was ordered to do so under a threat of termination.

474. Joe Dupree testified that a contractor working in a compressed environment with multiple changes will make errors and may not be able to develop a wholly accurate REA computation. (Tr. 8/31/07, 47:8 – 48:10.) In this environment, the workers may mischarge their time to existing cost codes instead of separately tracking the costs to a separate cost code. (Tr. 8/31/07, 46:5 – 47:7.)

475. Dupree further testified it is common that contractors do not track costs to a new separately established cost code because the contractor does not have the luxury of knowing when a change will come and how it will impact its work, especially in an environment of compressed time with multiple procedural and mandatory changes. (Tr. 8/31/07, 47:8 – 48:10.)

476. I find that BJC's multiple breaches of contract placed MACTEC in a position where it was difficult to compute and prove its damages. Further, I find that it is unreasonable for BJC to now complain about the specificity of MACTEC's damages when it was BJC's denial of legitimate schedule extensions, constant directives to accelerate, and threats of termination that placed MACTEC in a position where it was impracticable, if not impossible, to segregate its costs to the level of specificity now demanded by BJC. In any event, I find that, notwithstanding the difficulties created by BJC, MACTEC computed its damages with reasonable certainty.

VII. BJC'S BACKCHARGES

477. I find that BJC failed to establish that the costs it now seeks to backcharge MACTEC were attributable to any of MACTEC's work.

478. BJC is attempting to backcharge MACTEC for costs that BJC claims to have incurred due to its unilateral election to change the method to determine what adjustments were to be made to the DGT, rather than the method prescribed in the Subcontract of operating the DGT and WTF over a period of five months. One way to determine if the DGT was properly functioning would be to operate the DGT. (Tr. 9/6/07, 85: 11-18.) MACTEC would have obtained the same information that BJC obtained during two pumping test experiments had BJC allowed MACTEC to operate the DGT and the System. (Tr. 9/4/07, 60: 3-19; Tr. 9/6/07, 85: 15-18.) It would have taken much less than three months to obtain this data. (Tr. 9/6/07, 85:19-86:4.) BJC's expert, George Pinder unequivocally concluded in Opinion Five of his Expert Report that "[t]he measures taken [by BJC] to correct the clogging problem are consistent with basic concepts of groundwater flow and transport. To increase drawdown (lower the water table) one typically adds new wells and/or pumps more aggressively." (Def. Ex. 322, p. 21 ¶¶ .014 and .014.1)

479. It took Dr. Pinder two hours after first arriving at the site to determine that BJC needed to add a few more sumps and pumps to obtain sufficient drawdown within the DGT. (Tr. 9/6/07, 80:12-22.) BJC's adjustments were straightforward and something any hydrologist would have recognized as a way to achieve better trench performance. (Tr. 9/4/07, 62: 8-21.)

480. BJC made minor adjustments to the DGT. (Tr. 9/4/07, 102: 15-18.) The System met its performance objectives with these minor adjustments. *Id.*

A. MACTEC Had No Obligation To Achieve a Head Differential or Hydraulic Conductivity

481. BJC seeks to backcharge MACTEC for costs to conduct “experiments” on the DGT because BJC claims that MACTEC did not meet alleged design criteria. BJC seeks to hold MACTEC to design criteria that are found in documents and statements that are not part of the Subcontract.

482. On the Subcontract’s very first page, the parties listed all of the Subcontract documents comprising the parties’ agreement. (Pl. Ex. 57, Vol. 24, Bates PX57.0001.)

483. The Subcontract does not include the following documents as being part of the Subcontract: (1) the DGT’s design specifications, (2) MACTEC’s groundwater model, (3) MACTEC’s Technical Memorandum regarding the model, (4) Ron Lewis’ email dated January 23, 2001 regarding the groundwater model’s features, (5) Ron Lewis’ email dated January 5, 2001 regarding the groundwater model, or (6) the 30/60/90 design review comments dated February 22, 2001. (Pl. Ex. 57, Vol. 24, Bates PX57.0001; D. Ex. 20; D. Ex. 22; D. Ex. 21; and D. Ex. 10b.) These documents, upon which BJC purportedly relies to justify its backcharges, are not part of the Subcontract.

484. BJC relies exclusively upon extra-contractual emails and reports to attempt to establish alleged design criteria that MACTEC’s DGT was to achieve; a head differential of 0.1 feet and a K (hydraulic conductivity) of 10,000 feet per day. (D. Ex. 20; D. Ex. 22; D. Ex. 21; D. Ex. 10b.)

485. The Subcontract contains the following integration clause:

This Subcontract embodies the entire agreement between CONTRACTOR and SUBCONTRACTOR. The Parties shall not

be bound by or liable for any statement, representation, promise, or understanding not set forth herein. Nothing contained in proposals, correspondence, discussions, or negotiations prior to the date of this agreement has any effect on this agreement unless specifically incorporated herein. No changes, amendments, or modifications of any of the terms and conditions hereof shall be valid unless reduced to writing and signed by the Parties.

See General Condition GC-1 (Pl. Ex. 57, Vol. 24, Bates PX0057.0007)

486. The Court finds that there is no Subcontract requirement that MACTEC install a DGT that created a head differential of 0.1 feet with a K (hydraulic conductivity) of 10,000 feet per day. The Subcontract was a fully integrated contract. I find that the Subcontract expressly identifies documents that are incorporated into the Subcontract, but the documents BJC relies upon to establish alleged design criteria are not listed. I find that there is no evidence to indicate that the exhibits BJC relies upon to establish design criteria have been incorporated into the Subcontract through any subsequent modification. Thus, I find that BJC had no justifiable basis to backcharge MACTEC for BJC's "experiments" because MACTEC had no contractual obligation to meet the alleged design criteria which those experiments were allegedly designed to achieve.

487. At trial, BJC argued that MACTEC's as-constructed System was defective because it could not achieve an alleged .1 head differential or establish an alleged K (hydraulic conductivity) of 10,000 feet per day. However, during late 2004 and 2005 when BJC wrested control of the Project from MACTEC, BJC arbitrarily declared that the DGT was defective because it allegedly could not satisfy "target" or "design" water levels. The now allegedly critical head differential and hydraulic conductivity were not even mentioned during 2004 and 2005.

488. Determination of a target water elevation in the trench was not a stated goal of MACTEC's groundwater model and the model contains no references to a target or design water elevation. (Joint Ex. 1, Mitchell Dep. 109:20-110:7; Tr. 8/31/07, 198:21-199:24; Pl. Ex. 109. Vol. 29.)

489. Instead, the DGT's pumps contained level switches that would be set to turn the pumps on or off. (Tr. 8/31/07, 181:8 – 182:16; Tr. 8/30/07, 190:4-25.)

490. Each pump has a low level switch, a high level switch and a high-high level switch. (Tr. 8/31/07, 181:8 – 182:16; Tr. 8/30/07, 190:4 – 192:17; Tr. 9/04/07, 37:21 – 38:25.) When the water in the DGT reaches the low level switch level, the pump is instructed to turn off. (Tr. 9/04/07, 37:21 – 38:25.) The pump must be turned off at that point because there is no water in the DGT to pump and there is no need to operate the pump. *Id.* When the water in the DGT reaches the high level switch level, the pump is instructed to turn on and begin pumping. (Tr. 8/31/07, 181:8 – 182:16; Tr. 8/30/07, 190:4 – 192:17; Tr. 9/04/07, 37:21 – 38:25.) The high-high switch point sounds an alarm when the water in the DGT reaches that switch point. (Tr. 8/31/07, 181:8 – 182:16; Tr. 8/30/07, 190:4 – 192:17) This alarm indicates that there is too much water in the DGT and there is a possibility of the DGT overflowing. (Tr. 9/04/07, 37:21 – 38:25.)

491. Up until trial, BJC had consistently maintained that MACTEC's installed DGT was defective because the DGT could not obtain "target water levels." (Pl. Ex. 499, Vol. 38, BJC Meeting Minutes 12/14/05, Bates BJC SWSA4-61252.)

492. BJC's June 9, 2005 pump test presentation to the regulators indicates that MACTEC's DGT had to meet alleged "target water levels" for the three trench segments A, B, and C. (Pl. Ex. 496, Vol. 38, BJC SWSA4-104646.) This presentation

concluded that “Design levels and inward gradient from IHP will not be achieved by pumping one sump per segment.” (*Id.* at BJC SWSA4-104647.)

493. BJC’s letter to MACTEC – which addressed the first and second DGT pump test results and proposed corrective action – stated BJC’s position regarding BJC’s expectation that the DGT’s performance be judged against a “target water level.” (Pl. Ex. 500, Vol. 38, PX0500.0001 – PX0500.0005.) In that letter, BJC wrote: “[t]he ability to remove water down to the design/target level throughout the trench segment via pumping from a single sump was brought into substantial doubt as a result of the May 2005 pump tests...” (PX0500.0001); “In summary, the single-sump pump tests have confirmed the inability of the DGT to perform as designed ... [the DGT has problems] consistently achieving the design water level through the trench segment...” (PX0500.0002); “the design water levels are not achieved even when all four sums are pumped,” (PX0500.0003); and “the DGT will not operate in the manner in which it was designed by MACTEC to operate, as an effective drain where the design water elevation in each trench segment can be maintained throughout its length by pumping from a single sump...” (PX0500.0004)

494. BJC’s expert, George Pinder, in his report provided that the BJC experiments were “designed to determine a) whether water levels in the trench could be lowered along the length of the trench to the specified levels using one sump, b) whether water levels in the trench could be lowered along the length of the trench to the specified levels using more than one sump...” (D. Ex. 322, P. 20.)

495. The alleged design target water levels identified by BJC, however, were not target water levels, but instead were pump switch settings for the pumps. (Tr. 9/4/07, 46:18 – 47:17.)

496. These pump switch settings were estimates that were only meant to be used as guidance for the designers to estimate the initial depth to place the pumps. (Tr. 8/31/07, 198:21-199:24.) These pump switch settings would need to be adjusted depending upon the actual conditions encountered while setting the pumps in the field. (*Id.*; Joint Ex. 1, Mitchell Dep. 116:25 – 117:12; 35:4 - 36:13; Tr. 9/4/07, 37:3-16.) In fact, BJC's expert, Dr. Pinder confirmed that it is not uncommon to encounter actual field conditions that vary from the conditions assumed in the model. (Tr. 9/6/07, 82:5-8). ("It does occur, sometimes occurs fairly commonly").

497. BJC directed MACTEC to perform pumping tests on the DGT. BJC originally directed these tests because it believed that the DGT could not pump water to the alleged target or design water level. (Pl. Ex. 500, Vol. 38, PX0500.0001 – PX0500.0005)

498. I find that BJC incorrectly interpreted MACTEC's estimated pump switch levels to be design or target water level elevations.

499. I find that BJC consistently held MACTEC to an arbitrary requirement whereby MACTEC's DGT was to pump water out of the DGT until it reached a certain design or target water level. I find that MACTEC was not contractually required to meet a requirement of achieving a designed or target water level. I also find that MACTEC has consistently informed BJC that it did not have an obligation to meet target or designed water levels.

500. I also find that BJC's presently-asserted justification for wresting control of the DGT and Project from MACTEC (.1 head differential and hydraulic conductivity) differs significantly from BJC's previously stated reasoning (target water level). I find that up until trial, BJC repeatedly informed MACTEC that its installed DGT was defective

because it could not establish certain target or design water levels. Based upon this, BJC directed MACTEC to perform “experiments” upon the DGT to meet these target or design water levels. I find that BJC abandoned its initial position that the DGT could not meet certain target water elevations, the very position that BJC claimed as the basis to take control of the Project from MACTEC. Regardless, there was no contractual requirement for MACTEC to achieve a certain head differential, conductivity, or target water level. MACTEC was vested with the discretion and latitude to employ whatever means it determined to achieve the performance requirements of the Subcontract. MACTEC, the Subcontract, and BJC all contemplated testing of the System by operation of the DGT and WTF. BJC unilaterally changed the method of testing and must accept the financial consequences of the change. Accordingly, I find that BJC’s pumping tests were unjustified and not chargeable to MACTEC.

B. BJC Failed To Prove Its Damages

501. BJC is also backcharging MACTEC for several leak tests, dye tests and geophysical tests that were determined to be (1) inconclusive and (2) focused on areas outside the capped area which is beyond MACTEC’s Scope of Work. (Tr. 9/6/07, 114: 6-12; Pl. Ex. 514, Vol. 40.

502. BJC concedes that it deleted several work items from MACTEC’s fixed-priced contract, such as the work associated with the: (1) Wetlands Restoration; (2) Post 24 Guard Shack construction; and (3) LLLW Line Cutting & Capping.

503. The Subcontract was a lump sum, fixed-price contract. (Pl. Ex. 57, Vol. 24, PX0057.0001.) MACTEC has offered BJC credits for the work BJC deleted. BJC

rejects MACTEC's offers on the basis that these credits were either unsubstantiated or simply not reasonable.

504. I find that BJC deleted certain scopes of work from MACTEC's fixed-price contract. I also find that MACTEC offered BJC credits for this work. I find that MACTEC substantiated these offers of credit with project documents, project cost records and testimony of employees with first-hand knowledge of the issues. I find that BJC rejected the value of these credits without providing any substantiating documents or testimony to support its own claimed value. BJC is not entitled to its claimed credit values, but must accept MACTEC's offered credits.

505. BJC has suffered no damages. All of the costs BJC has incurred to implement its change in the method of incrementally performing experiments to determine which adjustments needed to be made to the DGT – in lieu of the five month operation period provided for in the Subcontract for operation of the DGT and WTF – have been reimbursed to BJC by DOE. (Tr. 9/5/07, 106: 19-23, 115: 15-20, 108:22-109:21.)

506. MACTEC could not have submitted its red-line drawings because the Subcontract required that these drawings be submitted after the work had been completed and MACTEC was not allowed to complete its work. (Tr. 8/30/07, 204: 6-18, 206: 13-19.) Nevertheless, MACTEC's claim for Subcontract balance and retainage includes a credit for the as-built drawings.

507. If BJC were required to pay to MACTEC the entire \$2.7 million that MACTEC has requested as Subcontract balance, that amount would be fully reimbursable to BJC under the M&I contract. (Tr. 9/5/07, 115: 15-20.)

C. MACTEC Was Prepared to Operate the System

508. BJC contends that despite MACTEC's repeated requests to operate the System, it was not in a position to test the DGT in late 2004 and early 2005. BJC alleges that MACTEC could not have operated the DGT during that time period because there were not enough piezometers installed to perform the O&M Plan. *Id.*

509. MACTEC's O&M Plan allowed MACTEC the flexibility to install additional piezometers – if needed – to achieve the System's performance criteria. (Tr. 8/31/07, 208:16 – 209:4.) This determination to add more piezometers would have been made during the operational phase as specified in the O&M Plan if deemed necessary. *Id.*

510. The installation of a piezometer is not a particularly large task. (Tr. 9/4/07, 92:24 – 93:5.) Dr. Shanahan concluded that MACTEC could have started the operation of the System without adding any more piezometers than were installed, but that MACTEC would have likely installed more as they proceeded. (Tr. 9/4/07, 94:17 – 95:2.)

511. BJC's own pumping experiments demonstrated that the System could be operated with the as-installed piezometers. (Tr. 9/4/07, 209:19 – 210:1.) That is, BJC's May 2005 pumping experiments only used the originally designed three sets of piezometers. *Id.* BJC chose to add more piezometers after it operated the DGT during this May pumping experiment. (Tr. 9/4/07, 207:20 – 208:5.)

512. I find that BJC's contention that MACTEC could not have operated the DGT as it planned because there were only "three sets of piezometers" is inconsistent with BJC's own pumping tests. BJC's May pumping test indicates that BJC obtained enough information during the operation of the DGT with the three (3) sets of originally planned piezometers to allow BJC to make further adjustments. I also find that had BJC allowed

MACTEC to operate the DGT and approved MACTEC's Work Instructions, MACTEC could have – and would have – easily installed the requisite piezometers. As Dr. Shanahan testified, installation of those piezometers was not a “large task.”

D. BJC's Alleged False Claims Act

513. The False Claims Act (FCA) imposes civil and criminal penalties on any person who “knowingly presents, or causes to be presented, to an officer or employee of the United States Government . . . a false or fraudulent claim for payment or approval.” 31 U.S.C. § 3729(a)(1). A “claim” under the FCA includes, “any request or demand . . . for money or property which is made to a contractor, or, if the United States Government provides any portion of the money or property which is requested or demanded.” 31 U.S.C. § 3729(c). For purposes of the FCA, a person acts “knowingly” if the person (1) has actual knowledge of the information, (2) acts in deliberate ignorance of the truth or falsity of the information, or (3) acts in reckless disregard of the truth or falsity of the information. 31 U.S.C. § 3729(b).

514. BJC's contract with DOE is a cost reimbursable contract, meaning that payments BJC makes to subcontractors such as MACTEC are reimbursable to BJC by DOE (Tr. 9/4/07, 136:10-11).

515. BJC requests that the court recommend that BJC assert any and all alleged False Claims Act violations to DOE's attention for further investigation.

516. However, the court does not have any claim under the FCA before it and makes no findings with respect to violations of the Act. Accordingly, the Court will not

recommend that any BJC allegation regarding violations of the False Claims Act be forwarded for investigation.

VIII. CONCLUSIONS OF LAW

A. The Subcontract

1. Federal Government Contract and Tennessee State Law Apply.

517. I find that the law of federal government contracts applies to this action. General Condition GC-4 of the Subcontract provides that the law of federal government contracts, including "decisions enunciated by federal judicial bodies, boards of contract appeal, and quasi-judicial agencies of the federal Government" applies to disputes arising out of the Subcontract. In addition, GC-4 also provides that the laws of the state of Tennessee shall apply where the law of federal government contracts is not dispositive.

2. The Subcontract Was a Performance Contract.

518. I find that the Parties entered into a performance contract. MACTEC's fulfillment of its Subcontract obligations was to be measured against specified performance measures. Because the parties entered into a performance contract, MACTEC had complete discretion to determine the means and methods it would employ to achieve the selected end result specified in the ROD and the Subcontract. The design and means of installing, and subsequently testing, the hydraulic isolation System were solely MACTEC's responsibility.

519. A performance contract differs from a contract where design specifications are provided to a contractor that set forth in detail the materials to be used and the manner in which the work is to be performed, and thus the contractor is required to follow them like a roadmap. See *J.L. Simmons Co. v. United States*, 188 Ct. Cl. 684, 689 (1969). A performance contract, on the other hand, merely sets forth an objective or an end result to be achieved, and the contractor is allowed to select the materials, means, and methods for accomplishing that result. *Id.*; see also *Aleutian Constructors vs. United States*, 24 Cl. Ct. 372, 378 (1991).

520. BJC contends that it should be permitted to backcharge MACTEC for the costs to study and “correct” the alleged leaks that allowed surface water and groundwater from beyond the capped area to infiltrate the DGT. BJC essentially argues that General Condition GC-32 shifts responsibility to MACTEC for the interpretation of the Subcontract. In fact, BJC claims that the Subcontract warned MACTEC of the potential existence of subterranean flow paths for water that would need to be considered in its design to achieve hydraulic isolation.

521. What BJC’s argument fails to consider, however, is Special Condition SC-36 which provides that MACTEC shall not be held responsible for any damages or increased costs arising out of any condition that existed before September 8, 2000. (Pl. Ex. 57, Vol. 24, Special Condition SC-36, Bates PX0057.0046 – PX0057.0047.) Specifically, Special Condition SC-36 provides that MACTEC “shall not be held responsible for liability, expense, or costs that may be incurred, imposed on, or asserted against [MACTEC] arising out of any condition, act, or failure to act which occurred before [MACTEC] assumed responsibility on September 08, 2000.” Moreover, the application of this provision to the

DGT is consistent with paragraph 2.3.3 of the Subcontract Scope of Work which provides that the “downgradient groundwater collection system... is to collect contaminated groundwater from the capped area....” (Pl. Ex. 57, Vol. 24, Bates PX0057.0073)

522. Special Condition SC-36 trumps General Condition GC-32. A fundamental principle of contract interpretation is that a contract must be considered as a whole, giving effect to all its parts. *New Valley Corp. v. United States*, 119 F.3d 1576, 1580 (Fed. Cir. 1997); *see also Allied Tech. Group v. United States*, 39 Fed. Cl. 125, 144 (1997) (“[c]ontracts and solicitations are to be read as a whole, so as to give meaning to all provisions.”) When two or more conflicting provisions cannot be harmonized, the rules of contract interpretation establish an order of precedence that may resolve the conflict.

523. The Subcontract’s General Condition CG-5 is an “order of precedence” clause expressly stating which provision controls over others in case of conflicts. *General Engineering & Mach. Works v. O’Keefe*, 991 F.2d 775, 780-81 (Fed. Cir. 1993), *citing Hensel Phelps Constr. v. United States*, 886 F.2d 1296, 1299 (Fed. Cir. 1989). GC-5 reads:

All Subcontract documents and subsequently issued Change Notices/Orders and Modifications are essential parts of this Subcontract, and a requirement occurring in one is binding as though occurring in all. In resolving conflicts, errors, or omissions, the following order of precedence shall be used:

1. Subcontract Form of Agreement (including modifications and special provisions therein)
2. Special Conditions
3. General Conditions
4. Exhibits attached thereto

524. I find that MACTEC is not liable for the costs BJC incurred to perform the leak tests, geophysical tests or dye tests because the source of the water infiltrating the DGT was a pre-existing condition that existed before MACTEC executed its Subcontract and is from areas outside of the cap. If there is any ambiguity or conflict between Special Condition SC-36 and General Condition GC-32, then the Special Condition takes precedence over the General Condition.

525. Throughout its Proposed Findings of Fact and Conclusions of Law, BJC argues that MACTEC did not have a performance based contract. For example, BJC attempts to hold MACTEC to design specifications such as the 0.1 head differential and hydraulic conductivity of 10,000 feet per day. Yet, BJC ignores the expressly stated six (6) performance criteria found in the Subcontract by which "performance will be measured."

526. The Subcontract between MACTEC and BJC was unmistakably a performance contract whereby MACTEC was expected and entitled to exercise its discretion and ingenuity in achieving the Subcontract's objective or standard of performance. *P.R. Burke Corp. v. United States*, 277 F.3d 1346, 1357 (Fed. Cir. 2002). Under a performance contract, a contractor such as MACTEC has the ultimate right to control its work. *Penguin Indus. v. United States*, 530 F.2d 934, 937 (Ct. Cl. 1976).

527. MACTEC had "complete discretion to determine how it would perform the work. Its only obligation was to accomplish the designated result." *Stuyvesant Dredging Co. v. United States*, 834 F.2d 1576, 1582 (Fed. Cir. 1987). As such:

Performance specifications "set forth an objective or standard to be achieved, and the successful bidder is expected to exercise his ingenuity in achieving that objective or standard of performance, selecting the means and assuming a corresponding responsibility for that selection."

Id. (quoting *Blake Constr. Co. v. United States*, 987 F.2d 743, 745 (Fed. Cir. 1993)).

528. A contractor that undertakes a performance contract has the freedom to select its means and methods to accomplish the performance criteria. See *C.H. Guernsey & Co. v. U.S.*, 65 Fed.Cl. 582, 605 (2005). (“[P]erformance specifications set forth an objective but do not specify the a [sic] method that must be followed to obtain the objective.”) Accordingly, a performance contractor such as MACTEC is to be judged by its ability to meet the overall performance specifications. MACTEC’s only obligation was to accomplish the end result.

529. I find that the Subcontract is a performance contract pursuant to which MACTEC is vested with both the responsibility and discretion to implement whatever design and construction measures it deems necessary to achieve the specified performance measures. I further find that BJC may not impose upon MACTEC the obligation to strictly comply with certain design criteria that are not incorporated into, or otherwise a part of the Subcontract - and may or may not have any bearing on attainment of the Subcontract performance requirements - found in extraneous emails, memoranda, and correspondence.

B. Changes to the Subcontract

1. BJC Is Liable to MACTEC for Constructive Changes Issued During the Project.

530. Under the constructive change doctrine, informal actions or inactions by the contractee, here BJC, that are not initially acknowledged to be a change in the scope of work may still constitute a change. A constructive change occurs when “a contract contains the standard ‘changes’ provision and the contracting officer [contractee], without

issuing a formal change order, requires the contractor to perform work or to utilize materials which the contractor regards as being beyond the [contractual requirements]." *Ets-Hokin Corp. v. United States*, 420 F.2d 716, 720 (Ct. Cl. 1970); see *National Sur. Corp. v. United States*, 31 Fed. Cl. 565, 579 n.11 (1994) (quoting *Miller Elevator Co. v. United States*, 30 Fed. Cl. 662, 678 (1994)). According to Philip L. Bruner and Patrick J. O'Connor, Jr.:

The theory underlying the constructive change concept is that where the government "should have" issued a change order authorizing the extra work in the first place, the court or board may direct the government to do what "should have been done" by directing the government to issue a formal change order. The doctrine in its modern guise is the embodiment of the ancient principle that "what should have been done will be done."

Bruner and O'Connor on Construction Law § 4:25 (2005) (emphasis added).

531. BJC imposed upon MACTEC numerous changes to the contract without using the Subcontract's Changes provision found at General Condition GC-18. For example, BJC orally directed MACTEC to accelerate its cap work (REA 66 and 99), haul less tonnage per truck load from the IHP to the local landfill and seal the "dirt burrito" so that it would not split when dumped at the local landfill (REA 71), required the re-performance of previously-completed work (REA 63 and 73), changed the materials MACTEC had to use (REA 59), and otherwise imposed conditions upon MACTEC that were different from those to which MACTEC was entitled (SCN 41, REAs 51, 52, 56, 57, and 64). In some instances, BJC specifically directed MACTEC to perform changed work (REA 50 and 65).

532. Although BJC did not use the Subcontract's Changes clause as the vehicle to alter the Subcontract, I find that BJC nonetheless changed the parties' contract

through these directives and the imposition of these conditions upon MACTEC. Accordingly, I find that MACTEC is entitled to a contract price adjustment as a result of these constructive changes despite BJC not having issued a formal change order.

2. MACTEC Is Entitled to Its Acceleration Costs.

533. Acceleration of contract performance is the speeding up of work in an attempt to complete performance earlier than otherwise required. Acceleration costs are compensable when the efforts taken by the contractor are directed by the contractee.

534. It is well established that acceleration frequently takes the form of "constructive acceleration" where the contracting officer [contractee] orders the contractor to meet the current schedule in the face of excusable delays. *Advanced Eng. & Planning Corp.*, ASBCA 53366, 05-1 BCA ¶ 32806, *modified on other grounds*, 05-1 BCA ¶ 32935; see also *Lagnion*, ENGBCA 3778, 78-2 BCA ¶ 13,260 (finding contractor was constructively accelerated and entitled to an equitable adjustment "for the extra costs incurred in attempting to adhere to the original contract schedule and the extra costs incurred working under conditions considerably more adverse than those originally contemplated.") BJC acknowledged at trial that it directed MACTEC to accelerate its work during 2003 and 2004 and required MACTEC to issue recovery schedules that still maintained the overall unextended original project completion date. Thus, BJC constructively accelerated MACTEC by directing MACTEC to adhere to the original contract deadline despite MACTEC suffering from what was acknowledged to be unusually severe weather.

535. Constructive acceleration may also be found when a contractee demands prompt performance from a contractor while simultaneously denying extensions for excusable delays or granting them only belatedly. *Norair Eng'g Corp. v. United States*, 666 F.2d 546, 549 (Ct. Cl. 1981) ("Where the Government refuses (for whatever reason) to tell the contractor until the end of the project just what delay is excusable and what is not, the contractor is under considerable additional pressure to accede to a request because it does not know whether it will be found liable for [government-imposed] damages."); see also *Purvis v. United States*, 1980 WL 20824 (Ct. Cl. 1980) (court held that granting time extensions at the end of the project resulted in constructive acceleration).

536. MACTEC requested several time extensions for the delays during calendar years 2003 and 2004 because of unusually severe weather. Even though BJC knew that the Project and MACTEC were suffering from unusually severe weather, and BJC had itself received a significant time extension from DOE for unusually severe weather, BJC rejected each one of MACTEC's requests and proposed schedules, often with a response threatening termination of the Subcontract. BJC also admitted that it directed MACTEC to accelerate its work to meet the unextended scheduled completion date. In response, MACTEC accelerated its work and incurred additional costs attempting to meet the unextended completion date through muddy and unworkable site conditions (REAs 66 and 69). Well after the construction work was completed and nearly two years after MACTEC's first request for a time extension, BJC finally (after MACTEC had been damaged due to its acceleration efforts,) acknowledged that the unusually severe weather in 2003 and 2004 impacted MACTEC and its related performance.

537. I find that MACTEC is entitled to its acceleration costs because (1) MACTEC experienced an excusable, or compensable, delay entitling it to a time extension; (2) MACTEC properly requested the extension; (3) BJC failed or refused to grant the requested extension; (4) BJC demanded that the Project be completed by the original completion date despite the excusable, or compensable, delay; and (5) MACTEC actually accelerated the work in order to complete the Project by the original completion date and incurred added costs as a result. See *Nello L. Teer Co. v. Washington Metropolitan Area Transit Authority*, 695 F. Supp. 583, 590-92 (D.D.C. 1988).

3. BJC's Directives Were Changes to the Performance Subcontract Entitling MACTEC To Compensation.

538. A performance contract provides the contractor the ultimate right to control its work. "In a performance contract ... [the contractor] must assume responsibility for the means and methods selected to achieve the end result." *Penguin Indus. v. United States*, 530 F.2d 934, 937 (Ct. Cl. 1976). But when the contractor is not allowed to follow its method of performance by the contractee's actions, the contractor is entitled to an equitable adjustment. Case law is clear on this issue:

[W]hen a contract prescribes the desired end but not the means of accomplishing that end, it is within the contractor's discretion to select the method by which the contract will be performed. A Government order rejecting the proposed method and requiring the contractor to perform in some other specified manner denies the contractor the opportunity to exercise a valid option as to the method of performance and changes the contract, justifying an equitable adjustment for additional costs incurred thereby.

North Star Alaska Housing Corp. v. United States, 30 Fed. Cl. 259, 285 (1993) *citing Mann Construction Co., Inc.*, AGBCA No. 444, 76-1 BCA ¶11,710; *Jack Graham Company*, ASBCA No. 4585, 58-2 BCA ¶1998.

539. Tennessee law also provides that “[i]f a general contractor engages a subcontractor to perform a part of the general contract, there is an implied understanding that the subcontractor will be given a reasonable opportunity to perform. The subcontractor is not liable for failure to perform if he has not been afforded a reasonable opportunity to perform, and in a proper case, may recover damages for such denial of opportunity.”

Foster & Creighton Com. v. Wilson Contracting Co., Inc., 579 S.W.2d 422, 425-26 (Tenn. Ct. App. 1978); *see also ACG, Inc. v. Southeast Elevator, Inc.*, 912 S.W.2d 163, 168 (Tenn Ct. App. 1995).

540. The Subcontract, Exhibit D (Scope of Work) Section 2.3.4, provides that MACTEC’s design should include a groundwater collection system that meets certain specified performance requirements. MACTEC designed, constructed and planned to operate its downgradient collection system which included both the WTF and the DGT. The ROD and Subcontract unequivocally contemplate the operation of the DGT and WTF as an essential component of the Project. Furthermore, MACTEC developed its own means of testing the collection system. That testing program was set forth in MACTEC’s O&M manual expressly identified in Exhibit D (Scope of Work) Section 2.3.4 and approved by BJC.

541. Section 2.3.4 of the Subcontract and MACTEC’s O&M Plan specifically provide that MACTEC had a five month period to operate the System so that it could make adjustments given actual conditions encountered. This detailed plan was MACTEC’s

specified and approved test of the downgradient collection system. BJC denied MACTEC the opportunity to begin this approved testing and operation when it deleted the Subcontract requirement to operate the WTF, and thus the System, on January 12, 2005, and refused to allow MACTEC to operate the System.

542. Not only did BJC prevent MACTEC from employing its own means and methods of testing the downgradient collection system, BJC then directed MACTEC to perform BJC's own collection system testing program. BJC demanded that MACTEC use a different means of testing the collection system than the means selected by MACTEC, approved by BJC, and specifically provided by the Subcontract, that is to "design, construct/install, and operate a system to treat water collected in the downgradient groundwater collection system...." This BJC directive to strictly employ BJC's pumping test program was a change to MACTEC's means and methods of testing. Yet, BJC's directed pumping tests produced the very same data and recommended adjustments to the collection system that MACTEC's O&M Plan would have reached, although BJC's directed testing and "experiments" were much more costly and lengthy. In fact, BJC's expert, Dr. Pinder, testified that he reached the same ultimate conclusion (adding a few pumps and sumps) within only two hours of studying the issue.

543. I find that MACTEC is entitled to an equitable adjustment of its contract price for REA 65. The corollary is that BJC is not entitled to backcharge MACTEC for the costs it alleges to have incurred to attempt to implement its unilateral change. The foregoing authorities stand for the proposition that when a change such as that issued by BJC relative to the testing and operation of the DGT is made, the contractor performing the

change is entitled to all costs resulting from the change. Thus, if BJC performed the work and incurred costs to implement its change, those cost cannot be charged to MACTEC.

544. This example of BJC changing MACTEC's means and methods does not stand in isolation. BJC also changed MACTEC's planned means of lining the dump trucks that hauled dirt from the IHP to the off-site landfill (REA 71). BJC required MACTEC to seal the "dirt burrito" so that it would not split when it was unloaded at the local landfill. MACTEC did not, nor could it, anticipate this requirement when it developed its means and methods of hauling and disposing dirt. I therefore find that BJC also arbitrarily changed MACTEC's means and methods of sealing the dump truck liners by requiring that these "dirt burritos" not split when unloaded at the landfill.

4. BJC Unilaterally Changed the Testing Requirements of the Subcontract

545. BJC cites this Court to Subcontract General Condition GC-29, "Inspection of Construction", to justify the pumping tests that BJC implemented in lieu of WTF and DGT operation, and to justify its backcharges against MACTEC. However, GC-29 specifically provides that "Subcontractor shall maintain an adequate inspection system and perform such inspections and tests as will ensure that the Work under the Subcontract conforms to the applicable requirements." BJC attempts to engraft on to the Subcontract certain design criteria which the court has concluded are not part of the Subcontract, and transform them into "the applicable requirements" of GC-29. However, the "applicable requirements" of the Subcontract are the performance requirements set out in the Subcontract itself. The Subcontract specifically provides for the operation of the WTF and DGT for a five month period, and a two year period of operation to determine whether the

System and DGT meet the performance requirements of the Subcontract. BJC prevented MACTEC from employing its own means and methods of testing the downgradient collection system and then directed MACTEC to perform BJC's own collection system testing program. When BJC demanded that MACTEC implement a different means of testing the collection system from the means selected by MACTEC, approved by BJC, and specifically provided by the Subcontract, that is to "design, construct/install, and operate a system to treat water collected in the groundwater collection system...", BJC changed the essence of the Subcontract and must itself absorb the costs of those changes.

546. BJC does not have the right to require testing above and beyond that specified in the Subcontract without an equitable adjustment to the Subcontract. Although BJC may insist upon contractor compliance with the terms of the contract, BJC "cannot impose a more stringent testing procedure or standard for demonstrating compliance than is set forth in the contract." *Sipco Servs. & Marine, Inc. v. United States*, 41 Fed. Cl. 196, 217 (1998) (*citing United Tech. Corp. v. United States*, 27 Fed. Cl. 393, 397 (1992)).

547. A contractor, cannot declare that a subcontractor's work is defective if the testing applied to reach that determination is not required by the inspection and performance standards set forth in the contract. *Sw. Welding*, 413 F.2d at 1183-84; *Teton Constr. Co.*, ASBCA Nos. 27700, 28968, 86-2 BCA ¶ 18,973, 1986 WL 19925 (1986) (The government cannot rely on results from a test which differ from those required by the contract.); *SMS Data Prod. Group, Inc. v. United States*, 17 Ct. Cl. 1, 10 (1989) (Any testing not required by the parties' agreement cannot be the basis for default.).

548. Moreover, it is also axiomatic that if the contractee's actions delay performance or increase the costs of the contractor, then the contractor should be

compensated for these damages. *Sipco*, 41 Fed. Cl. at 397 (citing *Lathan Co., Inc. v. United States*, 20 Cl. Ct. 122, 129 (1990)). A contractor is entitled to an equitable adjustment to its contract for work that passed inspection under the terms of the contract, where the contractee requires the contractor to meet inspection standards beyond the contract, thus causing extra work. *Sw. Welding & Mfg. Co. v. United States*, 413 F.2d 1167, 1186-87 (Ct. Cl. 1969) (The “government clearly ordered extra work above and beyond the requirements of the contract which it had drafted, and it should reimburse the contractor therefor pursuant to the standard ‘Changes’ clause contained in this contract.”). Similarly, a contractor is entitled to equitable adjustments when the owner requires testing in excess of specifications. *CEMS, Inc. v. United States*, 59 Fed. Cl. 168, 205-208 (2003) (stating that testing in excess of specifications amounted to a constructive change); see also *Delco Elec. Corp. v. United States*, 17 Cl. Ct. 302, 322-23 (1989) (discussing the principle of allowing equitable adjustment where government requirements exceed expectations of contract).

549. I find that BJC cannot hold MACTEC to testing procedures that are more stringent than the testing procedures set forth in the Subcontract. I further find that MACTEC is entitled to damages and an equitable adjustment for any increased costs or delays resulting from BJC’s actions requiring MACTEC to do work and submit to testing beyond the requirements of the Subcontract, such as the costs identified in MACTEC’s REA 65. Further, BJC may not recover its alleged damages to conduct its pumping tests and “experiments” which were beyond the Subcontract’s contemplation of operating the DGT and WTF for five months, during and for which MACTEC was to be paid in excess of \$200,000.

550. BJC asks the court to impose upon MACTEC design criteria of hydraulic conductivity and head differential found in extra-contractual design comments, technical memoranda, and internal emails, none of which was incorporated into the Subcontract. In contrast, the integrated Subcontract is unequivocal that MACTEC's performance was to be measured by the satisfaction of performance criteria. Further, none of the minor physical modifications to the DGT made by BJC – and which ultimately resulted in a fully functional DGT in that it achieved an inward gradient along the entirety of the DGT, thus meeting the performance requirements of the Subcontract – caused the DGT to possess the hydraulic conductivity or head differential which BJC erroneously contends was a Subcontract requirement. Moreover, none of the experiments and analyses allegedly undertaken by BJC was designed to, or did in fact, demonstrate any efforts to achieve these characteristics. BJC's contention that any alleged noncompliance with these extra-contractual "design criteria" constituted a breach of the Subcontract is belied by the performance requirements in the Subcontract itself as well as BJC's conduct.

551. BJC seeks to hold MACTEC to design requirements that are found in documents that are not in the parties' Subcontract. These documents cannot be used by BJC – after the fact – to vary the terms of the Subcontract pursuant to the parol evidence rule.

552. Tennessee courts have summarized the essence of the parol evidence rule:

[a]fter preliminary negotiations and oral conversation are concluded and a contract is reduced to writing that is clear and unambiguous, there is a conclusive presumption that the parties have reduced the entire agreement to writing, and that any parol agreement is merged into the written contract.

Testimony of prior or contemporaneous conversations for the purpose of altering, contradicting, or varying the terms of the written instrument are incompetent and inadmissible.

Faithful v. Gardner, 799 S.W. 2d 232, 235 (Tenn. Ct. App. 1990); see also *Airline Constr. Inc. v. Barr*, 807 S.W.2d 247, 259 (Tenn. App. 1990) (Parol evidence is inadmissible to contradict, vary, or alter written contract, where written instrument is valid, complete, and unambiguous, absent fraud or mistake or any claim or allegation thereof); *Next Generation, Inc. v. Wal-Mart, Inc.*, 49 S.W.3d 860, 863 (Tenn. Ct. App. 2001) (where a written document contains a clause stating that no other agreements exist other than the ones contained therein, it is final and cannot be varied by parol evidence). The parol evidence rule is well established in common law and is also embodied under Tennessee statutory law. See Tenn. Code Ann. § 47-2-202 (stating “[T]erms with respect to which the confirmatory memoranda of the parties agree or which are otherwise set forth in a writing intended by the parties as a final expression of their agreement with respect to such terms as are included therein may not be contradicted by evidence of any prior agreement or of a contemporaneous oral agreement....)

553. Questions of admissibility regarding parol evidence arise when a party seeks to introduce inconsistent terms to vary terms of a writing intended to be an integrated or complete expression of agreement. *Armistead v. Vernitron Corp.*, 944 F.2d 1287, 1295 (6th Cir. 1991); see also *David Nassif Assoc. v. United States*, 557 F.2d 249, 256 (Ct. Cl. 1977) (stating that the parol evidence rule prohibits the use of external evidence to alter or modify terms of a written agreement adopted by the parties as an expression of their final understanding); Tenn. Code Ann. § 47-2-202.

554. Equally important under Tennessee law is the existence of an integration clause. An integration clause conclusively establishes that the document is total unless the document is obviously incomplete or the merger clause was included as a result of fraud or any other reason to set aside the contract. *Rumsfeld v. Freedom NY, Inc.*, 329 F.3d 1320, 1329 (Fed. Cir. 2003). A contractual clause providing that a writing is meant to represent the parties' entire agreement, strengthens the conclusive statutory presumption that the agreement is a final expression of the parties' agreement. *In re Tom Woods Used Cars, Inc.*, at 568.

555. A fully integrated agreement "will conclusively establish that the contract is final and complete." *Exxon Mobil Oil Corp. v. Thomas*, 2006 WL 3511141 at *4 (E.D. Tenn. Dec. 4, 2006) (quoting 21 TENN. PRAC. CONTRACT LAW AND PRACTICE § 8:49 (2006)). "A completely integrated agreement must be interpreted on its face, and thus the purpose and effect of including a merger clause is to preclude the subsequent introduction of evidence of preliminary negotiations or of side agreements in a proceeding in which a court interprets the document." *Security Watch, Inc. v. Sentinel Systems, Inc.*, 176 F.3d 369, 372 (6th Cir. 1999).

556. The parol evidence rule protects the contract from evidence that will alter or contradict the written contract. *Schaeffer v. American Honda Motor Co.*, 976 F. Supp. 736, 741 (W.D. Tenn. 1997); *Airline Constr. Inc.*, 807 S.W.2d at 259; Tenn. Code Ann. § 47-2-202.

557. In a case containing an integration clause as found in the Subcontract, the Federal Circuit held that the non-incorporated documents were not part of the parties' contract. *Teg-Paradigm Environmental, Inc. v. U.S.*, 465 F.3d 1329, 1341-42 (Fed.Cir.

2006). In *Teg-Paradigm*, the contractor claimed that its work plans were part of the parties' contract and its performance should be measured against these work plans. *Id.* The Federal Circuit rejected this allegation because the contract expressly incorporated several extrinsic documents, but the work plans were not listed. *Id.* Instead, the court found that the contract's specifications governed the contractor's performance. *Id.* The court reasoned that the work plans were not part of the contract, but were rather a "submission used to aid the government in assessing TEG's ability to perform the contract." *Id.* The court concluded that the work plans were used to determine if the contractor would be able to perform. *Id.* But the contract's specifications that were expressly incorporated into the contract, not the detailed work plans, would determine how the contractor was judged.

558. I find that the documents BJC cites to establish the existence of the alleged design specifications of a head differential of 0.1 feet and a K (hydraulic conductivity) of 10,000 feet per day are not incorporated into the Subcontract. Accordingly, I find that these documents or statements do not impose any contractual obligation upon MACTEC pursuant to the parol evidence rule.

559. I also find that because the Subcontract contains an integration clause and that there were no modifications to the Subcontract to include the documents BJC relies upon to establish alleged design criteria, MACTEC had no obligation to meet these alleged design criteria.

560. The court rejects BJC's contention that the RDR/RAWP, a document used to demonstrate how MACTEC planned to meet its performance criteria, imposes any additional contractual obligations upon MACTEC.

5. MACTEC Properly Submitted REAs.

561. A contractor seeking an equitable adjustment must prove three elements: liability, causation, and resultant injury. *Blinderman Const. Co., Inc. v. United States*, 39 Fed. Cl. 529, 538 (1997). The proper standard used in determining whether each element has been met is the “preponderance of the evidence” test. *Id.* MACTEC has met its burden by proving that BJC’s acts or omissions, more likely than not, caused MACTEC to incur increased costs in performing the Subcontract. *Id.*

562. Accordingly, any increased costs flowing directly and necessarily from BJC changes either directed or constructive to MACTEC’s work are compensable. See *Elec. & Missile Facilities, Inc. v. United States*, 416 F.2d 1345, 1361 (Ct. Cl. 1969); *Paul Hardeman, Inc. v. United States*, 406 F.2d 1357, 1362 (Ct. Cl. 1969) (noting that the allowable equitable adjustment is “the difference between what it cost [the contractor] to do the work and what it would have cost [the contractor] if the unforeseen conditions had not been encountered”).

563. The Subcontract’s General Condition GC-20 contains a clause providing MACTEC the mechanism to receive an equitable adjustment to the contract price or schedule for impacts beyond its control. The Subcontract also contains a changes clause at GC-18 whereby the parties may modify the Subcontract pursuant to a MACTEC submitted REA. During the course of the Project, the parties modified the contract price and schedule based upon various MACTEC submitted REAs pursuant to both directed changes and as well as by way of constructive changes.

564. MACTEC’s pending REAs take the same format as the previously resolved REAs. I find that MACTEC’s pending REAs are properly requested contract

adjustments resulting from BJC actions. MACTEC has demonstrated to this court that it undertook all requisite measures in properly establishing entitlement. For the foregoing factual and legal reasons, I find that MACTEC's REAs were properly submitted and that MACTEC is entitled to recover its requested relief in the amounts set forth herein.

6. BJC Waived the Contractual Notice Requirement.

565. BJC claims that it is not liable to MACTEC for many of its pending REAs because the REAs do not strictly comply with the Subcontract's notice requirements. Thus, BJC urges this Court to summarily reject these pending REAs.

566. I find that BJC waived any contractual provision requiring notice of MACTEC's REAs. It is well established that a contractor's failure to strictly comply with contractual notice requirements does not serve as an automatic bar to the contractor's claim for equitable adjustment. In fact, the notice "requirement" has been interpreted liberally to hold that failure to submit timely notice will not bar a contractor's claim unless the contractee can establish that the lack of notice was prejudicial. *Chimera Corp.*, ASBCA 18690, 76-1 BCA ¶ 11,901 ("Appeal boards have generally not been inclined to dismiss or deny appeals based solely on the absence of formal notice under the Changes clause where prejudice to the Government's interest is not shown, and in the absence of compelling circumstances otherwise operating to bar the claim."); *B.L.I. Constr. Co.*, ASBCA 45560, 91-1 BCA ¶ 26,308.

567. BJC waived the notice requirements by its actions. There are numerous instances during the course of the Project where MACTEC submitted REAs to BJC without first complying with the Subcontract's notice requirements. Yet, as BJC admitted at trial,

BJC accepted, considered, and sometimes paid these “late filed” REAs. More importantly, at no time did BJC object to these allegedly “late filed” REAs.

568. Accordingly, I find that BJC waived strict compliance with the Subcontract notification procedures by establishing a course of conduct whereby BJC evaluated and paid MACTEC’s late filed REAs. *Branch Banking & Trust Co. v. United States*, 98 F. Supp. 757, 766 (Ct. Cl. 1951); *DeVito v. United States*, 413F.2d 1147, 1153-54 (Ct. Cl. 1969); *Copo Steel & Eng’g, Co. v. United States*, 341 F.2d 590, 169 Ct. Cl. 601 (1965) (requirement that demand for formal written notice to negotiate be in writing waived by plaintiff’s conduct); *Thompson v. United States*, 91 Ct. Cl. 166, 197 (1940); (contractor’s failure to timely assert a claim for adjustment of a change order was waived by defendant’s later consideration on merits); *Guyler v. United States*, 314 F.2d 506, 161 Ct. Cl. 159 (1963) (contractor’s failure to make a timely claim for equitable adjustment was waived by defendant’s consideration of claim on merits); *McShain v. United States*, 65 F. Supp. 589, 106 Ct. Cl. 280 (1946) (contractor permitted recovery for performance of extra work without formal written change orders where parties adopted procedure of postponing all claims until completion of job).

569. I further find that BJC had actual or constructive notice of MACTEC’s pending REAs and did not suffer any prejudice from MACTEC’s allegedly late filed REAs. *Precision Tool & Eng’g*, ASBCA No. 14148, 71-1 BCA ¶ 8738 (“The Board has overlooked the contractor’s failure to comply with time limitation for filing claims where the Government has been intimately aware of the underlying facts, including the fact that additional costs were being incurred from the outset.”); see also *H.H.O. Co. v. United States*, 12 Cl. Ct. 147, 164 (1987) (allowing contractor to assert claims under “Changes,” “Differing Site

Conditions," "Suspension of Work," and "Damages for Delay" clauses even though time required by contract clauses had passed where contractor presented evidence that government had received actual or constructive notice of the events); *Lelevator Corp. of America*, VABC No. 820, 71-1 BCA ¶ 8715 (even where prompt notification of excusable delay required by terms of contract, notice requirement is not strictly enforced where contractee has actual notice). BJC knew or should have known of MACTEC's REAs by way of project correspondence and various submittals. MACTEC made BJC aware of these events and impacts that form the bases of these pending REAs at the project meetings, through project correspondence and in schedule submittals. Further, many of these REAs stem from BJC directives to change MACTEC's means and methods. BJC cannot now claim that it was unaware of these claims and impacts.

570. I therefore find that BJC failed to carry its burden of proof that it was prejudiced by MACTEC's lack of timely contractual notice. *Chimera*, ASBCA 18690, 76-1 BCA ¶ 11,901.

571. I also find that BJC waived its notice defense pursuant to Tennessee law. Waiver is an abandonment of a known right. Generally a party may waive a known right through "express declaration, or by acts and declarations manifesting an intent and purpose not to claim the supposed advantage; or by a course of acts and conduct." *Baptist Physician Hosp. Org., Inc. v. Humana Military Healthcare Serv., Inc.* 481 F.3d 337, 352 (6th Cir. 2007) (emphasis added); see also *Bass v. Janney Montgomery Scott, Inc.*, 210 F.3d 577, 589-90 (6th Cir. 1999) (applying Tennessee law).

572. I find that BJC waived its notice defense to MACTEC's late filed REAs by receiving, considering, and in many instances paying MACTEC for previously submitted

REAs that did not meet the contractual notice requirements and/or other requirements. I also find that BJC had actual and/or constructive notice of MACTEC's claims and has therefore failed to show how it has been harmed by MACTEC's lack of contractual notice. Accordingly, I find that MACTEC's REAs 50, 51, 52, 53, 56, 57, 59, 60, 63, 65, 66, 69, 71, 73 and claims for additional contour fill and extended program costs are not subject to BJC's lack of notice defense.

7. BJC Waived Its Nonwaiver Clause

573. BJC argues that it did not waive the Subcontract notice requirements even though it routinely accepted, entertained, negotiated and settled REAs submitted by MACTEC that did not comply with these notice requirements. BJC contends that it may now selectively choose to enforce the notice requirements relative to REAs based on a non-waiver provision. However, the general rule is that a party may waive a non-waiver provision in a written contract through its course of conduct. *Porterco, Inc. v. Igloo Products Corp.*, 955 F.2d 1164, 1171 (8th Cir. 1992); *Lone Mountain Production Co. v. Natural Gas Pipeline Co. of America*, 984 F.2d 1551, 1557 (10th Cir. 1992) (parties may modify or waive terms of a contract despite a contractual provision to the contrary.); *Hospital Products, Inc. v. Sterile Design, Inc.*, 734 F. Supp. 896, 904 (E.D. Mo. 1990). The Sixth Circuit Court of Appeals recognizes this general principle holding that "a party to a written contract can waive a provision of that contract by conduct expressly or (sic) surrounding performance, despite the existence of a so-called anti-waiver or 'failure to enforce' clause in the contract." *A. Lopresti & Sons, Inc. v. General Car & Truck Leasing System, Inc.*, 79 Fed. App. 764, 769, 2003 WL 22442932 (6th Cir. 2003) (not selected for publication); *citing* 13 Richard A.

Lord, Williston on Contracts § 36 (4th ed. 1990). BJC entertained and settled many REAs submitted by MACTEC that did not comply with the strict contractual notice requirements throughout the course of the Project. BJC never once objected to or asserted a notice defense against MACTEC's "non-compliant" REA submittals.

574. I find that BJC intentionally waived both the notice and non-waiver provisions in the Subcontract through its persistent and intentional acts of negotiating and settling MACTEC's REAs even though they routinely did not comply with the Subcontract's notice requirements.

8. BJC Waived Its No Damages For Delay Clause

575. I find that BJC also waived the "no damage for delay" clause contained in its subcontract pursuant to Federal and Tennessee law. Waiver is an abandonment of a known right. Generally, a party may waive a known right through "express declaration, or by acts and declarations manifesting an intent and purpose not to claim the supposed advantage; or by a course of acts and conduct." *Baptist Physician Hosp. Org. Inc. v. Humana Military Healthcare Serv., Inc.*, 481 F.3d 377, 352 (6th Cir. 2007) (emphasis added); see also *Bass v. Janney Montgomery Scott, Inc.*, 210 F.3d 577, 589-90 (6th Cir. 1999) (applying Tennessee law).

576. I find that BJC waived the "no damage for delay" clause by considering and paying MACTEC for delay damages throughout the project in contravention to the "no damage for delay clause" set forth in the contract. Accordingly, BJC cannot now assert this as a defense to paying MACTEC's delay damages on specified REAs.

9. BJC Waived Certain Affirmative Defenses by Failing to Plead Them In Its Answer

577. BJC has also waived two affirmative defenses that it raises for the first time in its Proposed Findings of Fact and Conclusions of Law. BJC first claims that it is not liable to MACTEC for delay damages because the Subcontract contains Special Condition SC-20, a no-damages-for-delay clause. BJC essentially argues that MACTEC waived its right to seek delay damages because Special Condition SC-20 limits MACTEC's recovery only to a time extension.

578. BJC next claims that it is not liable for MACTEC's "late asserted" REAs because they do not comply with the strict notice requirements in the Subcontract. BJC cites General Condition GC-07, a non-waiver clause, alleging that it reserved the right to enforce the strict notice requirements despite its past conduct of paying claims that were not timely noticed.

579. BJC did not raise these two defenses in its Answer, nor has BJC raised this issue before its recently filed Proposed Findings of Fact and Conclusions of Law.

580. FRCP Rule 8(c) provides that any affirmative defense with respect to waiver shall be affirmatively pled in the Answer. Specifically, FRCP Rule 8(c) reads: "[i]n pleading to a preceding pleading, a party shall set forth affirmatively ... waiver and any other matter constituting an avoidance or affirmative defense."

581. It is well established that failure to plead an affirmative defense results in a waiver of that defense. *Old Line Ins. Co. of America v. Garcia*, 418 F.3d 546, 550 (6th Cir. 2005) (*citing Phelps v. McClellan*, 30 F.3d 658, 663 (6th Cir. 1994)); *Horton v. Potter*, 369 F.3d 906, 911 (6th Cir. 2004); *Kennedy v. City of Cleveland*, 797 F.2d 297, 300 (6th Cir. 1986). Accordingly, the affirmative defense of the Subcontract's notice requirements

and no-damages-for-delay clause has been waived because BJC elected not to raise either as an affirmative defense in its Answer when MACTEC's claims were first asserted.

582. I find that BJC's Answer to MACTEC's Complaint in this action does not include the affirmative defenses. To preserve these defenses, BJC was required to assert them in its Answer. It did not. BJC did not allege that MACTEC waived its right to seek delay damages pursuant to Special Condition SC-20 nor did BJC assert any notice defense. The first time BJC asserted these defenses is in its recently filed Proposed Findings of Fact and Conclusions of Law. Therefore, I find as a matter of law that BJC waived its right to assert its alleged no-damages-for delay defense or its notice defense.

10. BJC Was Not Prejudiced By MACTEC's Untimely Notice.

583. BJC alleges that it was prejudiced by MACTEC's alleged untimely notice of its claims. Not only was BJC aware of all the issues that comprise MACTEC's REAs at the time the issues arose, but BJC has failed to carry its burden to demonstrate any prejudice it may have suffered. *Ace Constructors, Inc. v. U.S.*, 70 Fed.Cl. 253, 272 (2006) ("The government bears the burden of showing prejudice ... that it might have minimized extra costs if proper notice had been given, or the passage of time obscured the elements of proof.")

584. In *Ace*, the Court of Federal Claims addressed a contractor's differing site condition REA whereby the contractor had to place additional fill quantities because of an incorrect topographical survey provided by the Government. *Id.* at 272. There, the Government argued that it did not receive timely notice of the differing site condition REA. *Id.* The court rejected this defense holding that the Government had received notice from

the contractor. The court held that “notice need not follow any specific format, but must merely make the Contracting Officer aware of the differing site condition … In fact, oral notice has been found to be sufficient to notify the Contracting Officer of the condition.” *Id.* at 273; *relying upon Shepherd v. U.S.*, 113 F.Supp. 648, 651 (Ct.Cl. 1953). According to the court in Ace, notice could take the form of a (1) request for information indicating that the elevations were lower than shown on the survey, (2) daily quality control report indicating that the topographical survey was incorrect, and (3) statement made during a meeting that the survey was inaccurate. *Id.* According to the Ace court:

[T]he [government] has the duty, once notice is given, to investigate the existence, nature, extent, and validity of the contractor's claim. It is not necessary that the allegedly new condition be set forth specifically and in detail. It is enough if the Government knows that the contractor is claiming such a condition in a certain area; no formal or technical requirements have been imposed.

Id.; *citing Farnsworth & Chambers Co. v. U.S.*, 346 F.2d 577, 581 (Ct.Cl. 1965).

585. The Government in Ace argued that it suffered prejudice because “the passage of time obscured the elements of proof” and because it “might have cost-effectively lowered the elevation of at least part of the site if it had received earlier notice.” *Id.* at 272-74. The court found that there was simply no evidence that the Government was prejudiced by the alleged delay in notice. To the contrary, the court found that the Government never once provided any alternative to the contractor during the time the topographical inaccuracies were being discussed. *Id.* at 274.

586. I find that BJC bears the burden of establishing that it was prejudiced by MACTEC’s alleged late notice. I find that it did not meet that burden. Further, I find that BJC was aware of MACTEC’s issues because it experienced these very same issues on

BJC's balance of cap work. Thus, BJC has failed to show any prejudice from MACTEC's REAs.

11. MACTEC's Weather Impacts Are Compensable.

587. I find that MACTEC is entitled to damages it suffered because MACTEC was forced by BJC to perform cap work, which involves primarily dirt work, during a wet season versus the originally planned dry season. MACTEC's Project delay and inefficiencies were a direct result of working in this unplanned wet season because of (1) BJC's work suspension, (2) other BJC impacts forced MACTEC to do the cap work in an unplanned wet season that experienced unusually severe wet weather, and (3) BJC's acceleration of MACTEC's work. *Charles Williams Constr., Inc.*, ASBCA 42592, 92-1 BCA ¶ 24635; see also *F.H. McGraw & Co. v. United States*, 82 F. Supp. 338, 340 (Cl. Ct. 1949).

12. MACTEC Suffered Compensable Impacts Because of BJC's Work Suspension.

588. I find that the Subcontract and Project documents demonstrate that MACTEC is entitled to recover the damages it incurred due to BJC's work suspension. This case is strikingly similar to *Williams Constr.*, in which the ASBCA was called upon to interpret and enforce contractual provisions analogous to the ones governing this case. In *Williams Constr.*, the parties' contract contained a work suspension clause similar to that found in the Subcontract. *Id.* According to the express terms of the work suspension clause, the ASBCA held that the government's suspension caused the contractor to incur

weather delay and additional costs. Although the contractor experienced unusually severe weather, the board found that it was the work suspension that caused the contractor to push its planned work from one season to another season. *Id.*

589. Similar to the project in *Williams Constr.*, the SWSA 4 Project was suspended by an uncontested BJC related work suspension. The Subcontract's work suspension clause GC-21 provides that MACTEC is entitled to any cost associated with BJC's suspension, delay or interruption of MACTEC's work. BJC issued a work suspension on this Project in 2001.

590. August, September and October are typically the driest parts of the year. (Tr. 9/5/07, 180: 18-24.) MACTEC actually performed its cap work starting in November, which is moving into the wet season. (Tr. 9/5/07, 180:25-181:9.)

591. I find that the evidence supports the conclusion that the weather during 2003 and 2004, the time period MACTEC was forced to perform its dirt work, adversely interfered with MACTEC's dirt work which would have been completed by the end of September 2002 had there not been the delay caused by BJC's work suspension. *J.D. Hedin Constr. Co. v. United States*, 347 F.2d 235, 254-55 (Ct. Cl. 1965).

13. BJC's Other Impacts Resulted in MACTEC's Damages.

592. MACTEC is entitled to recover for the damages it incurred due to BJC's other impacts. The *McGraw* court held that the contractor was entitled to increased costs because the government failed to furnish drawings to the contractor on time. *McGraw*, 82 F. Supp. at 338. This delay prevented the contractor from completing the contract by the date specified. This government delay resulted in increased costs because the contractor

had to perform the work in winter weather when the ground had frozen instead of a warmer season of the year. *Id.* at 340.

593. MACTEC experienced external impacts beyond its control that extended the critical path. In response to these external impacts, MACTEC had to reschedule its planned dirt work into the “wet season.” MACTEC then suffered severe storm events in 2003 and 2004 which resulted in a loss of efficiency related to cap work (dirt work). These external impacts adversely impacted on MACTEC’s overall performance because the cap work was on the critical path during 2003 and 2004.

594. BJC is responsible for these impacts that pushed MACTEC into a period of unusually severe weather. But for these BJC impacts, MACTEC would not have suffered from these unusually severe weather conditions. *American Household Storage Co. of Fla.*, GSBCA No. 751, 65-1 BCA ¶ 4523 (1986) (holding the contractor was entitled to extra compensation because “but for” the government’s delays, the contractor would not have suffered rain delays.)

595. I find, therefore, that BJC is liable to MACTEC for its loss of productivity resulting from unusually severe weather conditions during the calendar years 2003 and 2004. *Luria Bros. & Co. v. United States*, 369 F.2d 701, 714 (Cl. Ct. 1966).

14. MACTEC Is Entitled to Its Delay and Other Extended Program costs.

596. MACTEC has proven by a preponderance of the evidence that its delay damages were unforeseeable and thus excusable. *Mil-Craft Mfg., Inc.*, ASBCA 6936, 1962 BCA ¶ 10,840.

597. MACTEC presented evidence of its schedule delay through its scheduling expert's testimony. MACTEC's scheduling expert testified that he performed a Critical Path Method ("CPM") schedule analysis evidencing delays to its critical path. His analysis shows that MACTEC suffered compensable BJC-responsible delays to work items, such as the cap work, that were on the critical path. These delays forced MACTEC to staff its project for a longer duration than anticipated. Therefore, MACTEC is entitled to the additional costs that were identified in its expert's CPM analysis as program extension costs. I find that MACTEC's expert proved MACTEC's program extension costs were incurred through his CPM analysis. *Basic Constr. Co.*, ASBCA 22582, 79-1 BCA ¶ 13,577; *John Murphy Constr. Co.*, AGBCA 418, 79-1 BCA ¶ 13,836.

598. MACTEC is also entitled to its program extension costs pursuant to General Condition GC-21, "Suspension of Work" clause. A constructive suspension is any compensable delay not acknowledged as such by the owner that causes a suspension of work. A constructive suspension of work may take the form of: (1) delay not attributable to contractor fault; (2) delay resulting from contractee interference with contractor's work; (3) contractee delay of approvals; (4) delay in providing funding; (5) delay in inspection of the work; and (5) delay in issuance of changes. See *Bruner & O'Conner* § 15:87; *Fruehauf Corp. v. United States*, 587 F.2d 486 (Ct. Cl. 1978) (contractor could recover under the Suspension of Work clause for a delay of unreasonable length due to poor site conditions which were not attributable to any fault of the government); *C.H. Leavell & Co. v. United States*, 208 Ct. Cl. 776, 530 F.2d 878 (1976) (5 1/2 month delay in providing funds); *Weldfab, Inc.*, IBCA 268, 61-2 BCA ¶ 3121 (delay preceding the issuance of a change order).

599. MACTEC suffered unusually severe weather during 2003 and 2004 that impacted MACTEC's critical work items. BJC also delayed the issuance and payment of valid change orders. These events extended MACTEC's overall schedule and forced MACTEC to suffer extended program costs. I therefore find that BJC's actions constructively suspended MACTEC's work and that MACTEC is entitled to recover its program extension costs because of that constructive suspension.

15. Contaminated Subcontractor-Owned Equipment

600. As the contractor on a design-build performance contract, MACTEC had the sole responsibility to determine the means and methods of accomplishing its work. *Penguin*, 530 F.2d at 937.

601. In addition to this general principle, Special Condition SC-12 specifically provides that MACTEC is solely responsible for determining the "reasonable measures" that it will use to mitigate the potential for contamination of its equipment during the performance of work. Pursuant to Special Condition SC-12, if the equipment becomes contaminated despite MACTEC's best efforts, BJC will compensate MACTEC for the appraised value of the equipment.

602. MACTEC employed reasonable measures to ensure that a continuous trencher, a piece of equipment used to excavate the upgradient trench, did not become contaminated during its use on the Project. Despite its reasonable measures, BJC still directed MACTEC to undertake additional decontamination efforts at BJC's direction.

603. I find that BJC changed MACTEC's means and methods by directing MACTEC to perform additional decontamination measures to ensure that the continuous

trencher did not become contaminated. BJC must pay for this added layer of protective measures. Accordingly, BJC is liable to MACTEC for its increased decontamination efforts associated with REA 73.

16. BJC Is Liable to MACTEC for Impacts Associated with “Hot Spots.”

604. According to Subcontract Exhibit D, Section 2.3.7, MACTEC was to excavate miscellaneous small areas of elevated radioactivity “outside the SWSA 4 cap limits and place this material under the cap as contouring fill.”

605. The Subcontract’s Exhibit “C”, Form A Schedule of Quantities and Prices, provides a unit fixed price for this expected amount of “hot spot” work. According to this Exhibit, MACTEC should have expected to be compensated for any “hot spot” work above the contracted 500 cubic yards of contaminated volume. MACTEC’s construction supervisor, Mark Cade, testified that these “hot spots” occurred not only beyond the cap but also on the cap itself. The evidence shows that these additional “hot spots” resulted in MACTEC having to re-contour many sections of the cap. This required additional fill and contouring work.

17. MACTEC’s Reliance Upon BJC’s Inaccurate Topographical Surveys

606. It is well established that BJC warrants the adequacy of its design specifications and that MACTEC will not be responsible for the consequences of defects in them. See *United States v. Spearin*, 248 U.S. 132, 136 (1918); *J.D. Hedin Constr. Co. v. United States*, 347 F.2d 235, 241 (Ct. Cl. 1965). When BJC issued the topographical

surveys to MACTEC, it provided surveys that were inaccurate. Therefore, the topographical surveys were inherently defective.

607. The *Spearin* test for recovery based on inaccurate specifications is whether the contractor was misled by these defective specifications. *Spearin*, 248 U.S. at 136 (“[T]he contractor should be relieved, if he was misled by erroneous statements in the specifications.”); *Ragonese v. United States*, 120 F. Supp. 768, 771 (Ct. Cl. 1954) (Contractor entitled to equitable adjustment because the specifications did not mention that contractor was likely to encounter large quantities of subsurface water, thereby misleading the contractor.); see also *R.E.D.M. Corp. v. United States*, 428 F.2d 1304, 1310 (Ct. Cl. 1970) (allowing an equitable adjustment where there were erroneous specifications because the contractor relied upon them and was misled by the erroneous specifications.)

608. The evidence shows, and BJC has admitted, that the topographical surveys it provided to MACTEC were inaccurate. Moreover, MACTEC demonstrated at trial that it relied upon these inaccurate topographical surveys as the basis of its bid regarding contour fill requirements. MACTEC had no way of knowing that BJC’s topographical surveys were inaccurate. This reliance on inaccurate information led to the placement of additional contour fill.

609. It is evident from the record that BJC breached its implied warranty of the specifications, and this breach was the cause of MACTEC’s overrun in contour fill.

610. I find that MACTEC is entitled to be compensated for impacts which resulted from a growth of unanticipated “hot spots” on the cap, “hot spots” off the cap, and the defective topographical survey furnished by BJC to MACTEC, and that MACTEC is entitled to recover for its Increased Contour Fill Requirements claim.

C. Causes of Action

1. BJC Breached the Subcontract.

611. The essential elements of any breach of contract claim include (1) the existence of an enforceable contract; (2) nonperformance amounting to a breach of the contract; and (3) damages caused by the breach of the contract." *Life Care Ctrs. of Am., Inc. v. Charles Town Assocs. Ltd. P'ship, LPIMC, Inc.*, 79 F.3d 496, 514 (6th Cir. 1996).

612. BJC and MACTEC entered into a written, enforceable Subcontract. BJC, however, failed to perform pursuant to the terms of the Subcontract. For example, BJC failed and refused to pay MACTEC for services and materials MACTEC supplied pursuant to the terms of the Subcontract. BJC also breached the covenant of good faith and fair dealing that is implicit in every contract by, among other things, rejecting MACTEC's repeated requests for time extensions due to unusually severe weather while, at the same time, BJC obtained schedule relief from DOE for the very same impacts. *Celeron Gathering Corp. v. United States*, 34 Fed. Cl. 745, 752 (1996). Based upon the foregoing facts, I find that as a matter of law BJC breached the Parties' Subcontract.

2. BJC Breached Its Covenant of Good Faith and Fair Dealing.

613. As a contracting partner, BJC owed MACTEC a duty of good faith and fair dealing. BJC had an affirmative duty to render reasonable cooperation and not to hinder MACTEC's performance. *Celeron*, 34 Fed. Cl. at 752; see also *Mason v. USEC, Inc.*, 2007 WL 2471730 (E.D. Tenn. 2007) ("Thus, each party to a contract promises to perform its part of the contract in good faith.") (*citing Barnes & Robinson Company, Inc. v.*

Onesource Facility Services, Inc., 195 S.W.3d 637, 642 (Tenn. Ct. App. 2006)). A claim for breach of the duty of cooperation concerns the reasonableness of BJC's actions given the facts and circumstances at the time. *Bradley Const., Inc. v. United States*, 30 Fed. Cl. 507, 511 (1994). I find that BJC did not act in good faith or fair dealing with MACTEC throughout the course of the Project.

3. BJC's Denials of Schedule Extensions Constitute Bad Faith.

614. BJC's repeated denial of MACTEC's schedule extensions and threats to terminate are acts of bad faith. BJC knew that MACTEC was being severely impacted by the weather, yet it refused to provide MACTEC relief while directing it to accelerate its work. This constitutes bad faith on BJC's part.

615. Courts judge the wrongfulness of a party's actions at the time it occurred. *Freedom*, 329 F.3d at 1331; *relying upon Pigeon v. U.S.*, 27 Ct.Cl. 167, 175 (1892). In *Freedom*, the court found that the Government withheld payments to the contractor, who was in known financial distress, not for a legitimate contractual reason, but because it wanted to pressure the contractor into signing an onerous modification. *Id.* The court rejected the government's reason for rejecting payment as being an "after-the-fact justification for an action that was taken for an improper purpose." *Id.*

616. BJC acted in bad faith by denying MACTEC's requests for schedule extensions. While BJC was consistently rejecting MACTEC's request for time extensions due to severe weather, BJC itself received a time extension from DOE for the very same unusually severe weather conditions encountered by MACTEC. During this same period of severe weather, BJC was also threatening MACTEC with termination and directing

MACTEC to accelerate its work. BJC then reaped the benefits of MACTEC's accelerated work by receiving 100% of its Performance Based Incentives associated with MACTEC's work during this period of time. (Tr. 9/5/07, 110:1-112:21.) BJC acted in bad faith.

617. BJC's bad faith entitles MACTEC to recover all its damages that it could have recovered under a breach of contract theory. *Morrison Knudsen Corp., v. Fireman's Fund Insurance Co.*, 175 F.3d 1221, 1243 (10th Cir. 1999); *relying upon Apex Int'l Mgmt. Servs., Inc.*, ASBCA No. 38087, 94-2 B.C.A. ¶ 26,842 at 133,550 (1994).

618. I find that BJC knew that MACTEC was suffering from severe weather during 2003, 2004 and 2005. Yet, BJC repeatedly denied MACTEC any schedule relief. I find that BJC's motivation to repeatedly deny and threaten MACTEC was borne out of its own self-interest to receive an additional performance based incentive ("PBI") fee from DOE. It was not, as BJC now claims, based upon any technicality that MACTEC failed to meet in submitting its time extension. I therefore find that BJC acted in bad faith toward MACTEC by denying its schedule extensions, directing MACTEC to accelerate its work and threatening to terminate MACTEC while it received the benefit of a time extension from DOE for the very same impacts and reaped the financial benefits of MACTEC's acceleration efforts. Accordingly, I find that MACTEC is entitled to recover damages for BJC's bad faith.

619. BJC did not deal in good faith, with common fairness, or common equity by, among other things (1) repeatedly threatening MACTEC with termination when there was no basis to do so; (2) failing to grant legitimate time extensions for unusually severe weather while BJC knew that MACTEC was suffering from such delays and after having itself received the same relief from DOE; (3) declaring to the regulators that MACTEC's

DGT was defective when in fact it was not, and doing so without seeking or incorporating MACTEC's input; (4) refusing to permit MACTEC to develop the sums in the DGT so that it could operate the WTF, and instead demanding a "silt free" DGT which it acknowledged was technically impossible; (5) declining MACTEC's request to participate in the June 9, 2005 presentation to the regulators regarding the DGT; (6) forcing MACTEC to perform a completely new topographical survey without a time extension while holding MACTEC to the RDR milestone date; (7) holding MACTEC to unreasonable schedule deadlines, thereby resulting in significant increased costs to MACTEC, so that, in part, BJC could obtain its own performance based incentives that totaled in excess of \$2,250,000; and (8) informing MACTEC for the first time that BJC elected to delete the WTF on January 12, 2005, although BJC had internally concluded to delete the WTF as early as April 2003.

4. MACTEC's Claim for Unjust Enrichment

620. To recover for unjust enrichment in Tennessee, MACTEC must demonstrate that there was: (1) "[a] benefit conferred upon the defendant by the plaintiff"; (2) an "appreciation by the defendant of such benefit"; and (3) an "acceptance of such benefit under such circumstances that it would be inequitable for him to retain the benefit without payment of the value thereof." *Whitehaven Community Baptist Church v. Holloway*, 973 S.W.2d 592, 596 (Tenn. 1998).

621. MACTEC provided additional manpower and materials at the direction of BJC throughout the course of the Project. BJC was fully aware that MACTEC performed this additional effort and accepted the benefit of MACTEC's additional efforts. MACTEC has not been paid for those additional efforts.

622. In the alternative to a breach of contract action, I find that MACTEC conferred upon BJC a benefit that BJC requested, appreciated and accepted, but for which it did not compensate MACTEC. Given these circumstances, it would be inequitable for BJC to retain the benefit of MACTEC's services without payment.

5. MACTEC's Claim for *Quantum Meruit*

623. To recover for *quantum meruit* in Tennessee, MACTEC must demonstrate that: (1) there was no existing, enforceable contract between the Parties covering the same subject matter; (2) the party seeking recovery proves that it provided valuable goods or services; (3) the party to be charged received the goods or services; (4) the circumstances indicate that the parties to the transaction should have reasonably understood that the person providing the goods or services expected to be compensated; and (5) the circumstances demonstrate that it would be unjust for a party to retain the goods or services without payment. *Swafford v. Harris*, 967 S.W.2d 319, 324 (Tenn. 1998).

624. In the alternative to a breach of contract and an unjust enrichment recovery, I find that in the event there was no enforceable contract between MACTEC and BJC for the costs claimed herein, MACTEC provided additional manpower and materials at the direction of BJC throughout the course of the Project. BJC was fully aware that MACTEC performed this additional effort and accepted the benefit of MACTEC's additional efforts. MACTEC expected to be paid for these additional efforts. MACTEC has not been paid for these additional efforts.

625. I find that MACTEC conferred upon BJC a benefit that BJC appreciated and accepted. Given these circumstances, it would be inequitable for BJC to retain the

benefit of MACTEC's services without payment, and MACTEC is entitled to be compensated as set forth herein.

6. MACTEC's Tennessee's Prompt Payment Act Claim

626. MACTEC has shown that it is entitled to payment for services rendered pursuant to the written Subcontract for which BJC has failed to make payment. These services were performed by MACTEC in accordance with the terms and provisions of the Subcontract. MACTEC has also provided BJC with the requisite notice pursuant to T.C.A. §66-34-602 (a)(1) and (2). Accordingly, I find that MACTEC is entitled to both attorneys' fees and interest under the Tennessee Prompt Payment Act. *Southeast Drilling & Blasting Services, Inc. v. Hu-Mac Contractors, LLC*, 2003 WL 22055964, at *4 (Tenn. Ct. App. Sept. 4, 2003).

627. As set forth above, MACTEC is entitled to attorneys' fees because BJC did not deal in good faith, common fairness, or common equity.

628. I find that as a matter of law MACTEC is entitled to payment from BJC of interest and attorneys' fees pursuant to T.C.A. § 66-34-301 for its failure to pay MACTEC for its services as well as for BJC's pervasive bad faith and unfair dealings.

D. MACTEC's Damages

1. MACTEC's Damages are supported by the evidence.

629. BJC argues that MACTEC failed to substantiate its damages because it alleges that MACTEC did not provide any supporting third-party invoices, proposals, daily logs, time sheets or supporting cost records. BJC also contends that MACTEC's damages

are inadequate because it did not properly segregate its damages. BJC's allegations are without merit.

630. The case law is clear that MACTEC "need not prove [its] damages with absolute certainty or mathematically exactitude." *Delco*, 17 Cl.Ct. at 319; *citing Wunderlich Contracting Co. v. U.S.*, 351 F.2d 956 (Ct.Cl. 1965). In fact, a plaintiff's burden of proof is satisfied when it presents a reasonable basis for computation. *Id.* MACTEC's evidence must merely be "sufficient to enable the Court to make a reasonable approximation." *Transtech Corp., Space Ordnance Systems Division, v. U.S.*, 21 Cl.Ct. 349, 362 (1990).

631. Further, courts and boards alike have routinely held that a contractor is not obligated to segregate its costs when it is impractical. *Delco*, 17 Cl.Ct. at 328; *relying upon Robert McMullan and Sons, Inc.*, ASBCA No. 19129, 76-2, B.C.A. ¶12,072. As in *Delco*, MACTEC's contract and performance was continually interrupted and extended by BJC's conduct and directives. As such, it was impractical for MACTEC to segregate its costs given the working environment imposed upon it. *Id.*

632. MACTEC properly tracked and segregated its costs, although MACTEC was not required to do so. MACTEC did not have this burden since BJC continually interrupted and extended MACTEC's performance. I also find that MACTEC's evidence provides this Court sufficient information for it to render a reasonable computation of MACTEC's damages.

2. BJC Is Estopped From Complaining About The Specificity of MACTEC's Damages.

633. Not only did MACTEC satisfy its burden of proof regarding its damages, but BJC is estopped from complaining about their alleged inadequacies because BJC's breaches placed MACTEC in a difficult position to track its damages.

634. It is well-settled law that in breach of contract situations, the party whose conduct rendered the ascertainment of damages with precision difficult, cannot complain that the damages cannot be calculated with exactness. *Eastman Kodak Co. of N.Y. v. S. Photo Materials, Co.*, 273 U.S. 359, 379 (1927). Thus, the general rule is when a breaching party's breach places the non-breaching party in a position where it becomes difficult to compute and prove its damages, the breaching party is estopped from attacking the insufficiencies of the non-breaching party's damage calculation. See *Bigelow v. RKO Radio Pictures, Inc.*, 327 U.S. 251, 264 (1946); see also *Celeratis Tech., Ltd. v. Rockwell Int'l Corp.*, 150 F.3d 1354, 1360 (Fed. Cir. 1998); *First-Citizens Bank & Trust Co. v. United States*, 76 F. Supp. 250, 274 (Ct. Cl. 1948). The federal courts routinely hold that a "defendant which 'has violated [its contract should] not be permitted to reap advantage from [its] own wrong ... [and] to escape liability because of the lack of perfect measure of the damages caused by [its] breach.'" *Wilco Floor Serv., Inc. v. United States*, 1972 WL 20794 at *31 (Ct. Cl. Mar. 17, 1972). As the *Bigelow* court held, "any other rule would enable the wrongdoer to profit by its wrongdoing at the expense of its victim." See *Bigelow*, 327 U.S. at 264.

635. I find that BJC breached its contract with MACTEC in many different respects. Among those breaches are BJC's wrongful denial of time extensions, acceleration directives, and unjustified threats of termination all of which were designed to, and did, force MACTEC to perform in muddy, unworkable conditions and in an ill-

sequenced and inefficient manner. I further find that BJC's breaches placed MACTEC in a position where it is difficult to compute and prove its damages. Therefore BJC is estopped from attacking insufficiencies in MACTEC's damages computation.

3. MACTEC Provided Sufficient Evidence to Support Its Damages.

636. When establishing damages, it is well settled that the award of damages must be sufficient to "place the injured party in as good a position as he or she would have been had the breaching party fully performed." *San Carlos Irrigation & Drainage Dist. v. United States*, 111 F.3d 1557, 1562-63 (Fed. Cir. 1997). Further, breach of contract damages must be reasonably foreseeable and contemplated at the time of the contract's execution. *California Oregon Broadcasting, Inc. v. United States*, 74 Fed. Cl. 394, 405 (2006).

637. When calculating damages, it is also well established that a contractor need not prove its damages with absolute certainty or mathematical exactitude; it is sufficient if it furnishes the court with a reasonable basis for computation even though the result is only approximate. *Blinderman*, 39 Fed. Cl. at 543; *Houston Ready Cut House Co. v. United States*, 96 F. Supp. 629, 639 (Ct. Cl. 1951) (holding that "absolute certainty as to the amount of the damages is not essential, this being a matter for determination according to the circumstances of each case. All that the law requires is that such damages be allowed as, in the judgment of fair men resulted from the breach of contract . . .")

638. MACTEC has proved its increased costs by submitting evidence of actual cost data for the additional work. *American Line Builders, Inc. v. United States*, 26

Cl. Ct. 1155, 1182 (1992); *Cherry Hill Constr., Inc. v. General Svcs. Admin.*, GSBCA 12087-REIN, 93-2 BCA ¶ 25,810. In addition, MACTEC has also provided testimony that shows a causal connection between the actual costs incurred and BJC's breaches, directives, and changes.

639. A contractor, such as MACTEC, must present "reasonably satisfactory proof of increased costs based on acceptable cost allowance principles or expert testimony, so that the determination of the amount of damages will be more than mere speculation. The hallmark of allowability of any item of increased costs is its reasonableness." *Neal & Co. v. United States*, 17 Cl. Ct. 511, 513 (1989).

640. Where actual cost data was unavailable, MACTEC properly submitted estimates, which may be supported by substantiating data, expert testimony, or statistical techniques, as proof of its increased costs. *Paccon, Inc.*, ASBCA 7890, 65-2 BCA ¶ 4996, *recons. denied*, 65-2 BCA ¶ 5227 (detailing types of data used to support estimates); *Monroe Garment Co.*, ASBCA 14465, 75-2 BCA ¶ 11,569 (permitting the use of formulas as a proper basis for computing an equitable adjustment estimate); *Sovereign Const. Co.*, ASBCA 17792, 75-1 BCA ¶ 17,792 (utilizing expert testimony to support estimated costs).

641. MACTEC has also proved its damages under Tennessee law. Under Tennessee law MACTEC's burden is to prove by a preponderance of evidence the amount of damages, which means the evidence must have the greater convincing effect on the trier of fact. *Walker v. Sidney Gilreath & Assoc.*, 40 S.W.3d 66, 71 (Tenn. Ct. App. 2000). In general, Tennessee courts allow recovery even where it is "impossible to prove the exact amount of damages from breach of contract. Otherwise, in certain instances, the courts would be powerless to help some wronged parties ... the law does not require exactness

of damages growing out of contract or tort." *Id.* at 72 (internal citations omitted). I find that under Tennessee law, MACTEC has presented data from which the amount of probable loss could be ascertained as a matter of reasonable inference. *Agricultural Serv. Ass'n, Inc. v. Ferry-Morse Seed Co., Inc.*, 551 F.2d 1057, 1072 (6th Cir. 1977) (applying Tennessee law).

642. MACTEC has shown clearly that it suffered damages as the result of BJC's breaches, directives, and changes.

2. The Court May Apply the Jury Verdict Method.

643. It is well settled that the calculation of damages is not an exact science. *Western Contracting Corp. v. United States*, 144 Ct. Cl. 318, 320 (1958). The court holds that MACTEC has provided sufficient evidence to substantiate its damages.

644. But even if it were found that MACTEC did not have specific evidence to support its damages, which it does, an inability to determine the precise amount of damages attributable to BJC's breaches of contract does not preclude the court from entering judgment for MACTEC. This court, like other federal courts, may apply the jury verdict method when determining breach of contract damages. *Columbia First Bank, FSB v. United States*, 60 Fed. Ct. 97, 109 (2004). In doing so, the court assumes the role of the jury and is allowed to use its best judgment in estimating the damages. *Id.* (citing *Bluebonnet Sav. Bank, FSB v. United States*, 266 F.3d 1348, 1357 (Fed. Cir. 2001)).

645. The court must only find that the breach was a "substantial factor" and that the damages suffered by MACTEC flowed "inevitably and naturally" from that breach. *Id.* I find that MACTEC's damages "inevitably and naturally" flow from BJC's breaches of

contract. I therefore find that the jury verdict is an appropriate alternative method of calculating MACTEC's damages.

5. MACTEC Met Its Burden of Proof Regarding Its Interest Calculation.

646. The court has discretion in determining whether prejudgment interest is applied and how it is calculated. A recently decided Tennessee case provides that "the trial court's discretion 'extends not only to awarding of prejudgment interest but also to the amount of interest allowed and the time over which it should be calculated.'" *Mabey v. Maggas*, 2007 WL 2713726, at *10 (Tenn. Ct. App. Sept 18, 2007) (*citing AHCI, Inc. v. Lamar Adver. of Tenn., Inc.*, 1994 WL 25848, at *4 (Tenn. Ct. App. Jan 26, 1994)). When making this determination, the court considers that "prejudgment interest awards are based on the recognition that a party is damaged by being forced to forego the use of his money from the time that he should have received it until the date of judgment." *Mabey*, 2007 WL 2713726, at *10.

647. The court may award prejudgment interest as early as from the date of loss. *Harber v. Leader Fed. Bank for Savings*, 159 S.W.3d 545, 556 (Tenn. Ct. App. 2005). Pursuant to Tennessee law, the court may also award pre-judgment interest up to 10% *per annum* pursuant to T.C.A. § 47-14-123.

648. MACTEC calculated its prejudgment interest at 10% *per annum*. MACTEC applied a rate of 10% *per annum* to its outstanding Subcontract balance and retainage from the date MACTEC filed its Complaint. MACTEC applied 10% *per annum* to its outstanding REAs and other claims from the date the REA was submitted.

649. I find that MACTEC is entitled to its prejudgment interest and that its calculation is fair as a matter of law.

E. BJC's Counterclaims

1. BJC Is Not Entitled to Backcharge MACTEC for Work that BJC Directed.

650. In addition to the conclusion reached above that BJC cannot backcharge MACTEC for BJC's changes to MACTEC's means and methods, I find that BJC breached its implied duty not to interfere with MACTEC's performance. *George A. Fuller Co. v. United States*, 69 F. Supp. 409, 411 (Ct. Cl. 1947) (it is "an implied provision of every contract, whether it be one between individuals or between an individual and the Government, that neither party to the contract will do anything to prevent performance thereof by the party or that will hinder or delay him in its performance"). When BJC's wrongful interference disrupts or impedes MACTEC's manner of performance, thereby making the performance more costly, difficult or impossible, MACTEC is permitted to recover for BJC's breach of the duty not to interfere. *Louis M. McMaster, Inc.*, AGBCA No. 76-156, 79-1 BCA ¶13,701; see also *Lewis-Nicholson, Inc. v. United States*, 550 F.2d 26, 30 (Ct. Cl. 1977).

651. BJC interfered with MACTEC's performance by descoping one of the System's critical components, the WTF. The ROD and the Subcontract specifically provided that the treatment of water would enhance the effectiveness of the hydraulic isolation system. Moreover, the Subcontract work specifically deleted by BJC included MACTEC's prescribed testing program that would be used to demonstrate that the WTF

and the DGT were performing as designed, and allow MACTEC the opportunity to make the necessary adjustments under actual conditions.

652. BJC changed MACTEC's means and methods. Specifically, after BJC refused to allow MACTEC to develop the sumps in the Fall of 2004, one of the initial steps in operating the System, BJC directed MACTEC to develop an additional pumping test other than the operations procedures detailed by MACTEC and approved by BJC in the O&M Plan. BJC abruptly halted MACTEC's development of additional procedures before the date they were due to be submitted when BJC issued its January 12, 2005 letter informing MACTEC that BJC itself would instead create an alternate pumping test program to test the DGT.

653. I find that BJC interfered with, and changed, MACTEC's performance by directing MACTEC to perform a BJC-designed pumping test in lieu of MACTEC's identified and BJC-approved testing procedures of operating the DGT and WTF as specified in the Subcontract and the O&M Plan. MACTEC's approved means to test the System was to operate it for a period of five months and make necessary adjustments. Although BJC may change the parties Subcontract, specifically the testing program, it must pay for it and assume itself the costs it incurred designing and implementing "experiments" to effect its unilateral change to the testing and adjustment procedures of operating the DGT and WTF for five months as provided by the Subcontract. It is unfair and inequitable for BJC to reap the benefits of its interference by now backcharging MACTEC for the BJC directed testing and alleged defective work when MACTEC had a reasonable, approved and contractually-specified testing program in place that would have reached the same data and recommended adjustments as BJC. Further, BJC acknowledged that by

interfering with, and changing, MACTEC's testing, monitoring, operating and adjustment process, BJC saved in excess of \$1,200,000 by not operating the WTF. In any event, to the extent BJC were entitled to recover any costs from MACTEC for its experiments – and it is not – MACTEC would be entitled to a credit of \$1,200,000 against such costs, as BJC is only entitled to be placed in the same position in which it would have been absent any breach.

2. BJC failed to establish the value of its deleted work

654. BJC requests that this Court reject the credits MACTEC offered to BJC for work that BJC deleted from MACTEC's fixed-price contract. BJC concedes that it deleted several work items from MACTEC's fixed-priced contract, such as the work associated with the: (1) Wetlands Restoration, (2) Post 24 Guard Shack construction, (3) Project's WTF, and (4) LLLW Line Cutting & Capping. MACTEC has offered BJC credits for the work BJC deleted. BJC rejects these credits because it alleges MACTEC did not meet its burden of proof in establishing their values.

655. However, the case law is clear that BJC, not MACTEC, carries the burden of proof to establish the value of a credit when BJC deletes work from MACTEC's fixed-price contract. See *George Sollitt Construction Co. v. United States*, 64 Fed.Cl. 229, 246 (2005); *relying upon Nager Elec. Co. v. United States*, 194 Ct.Cl. 835, 442 F.2d 936, 946 (1971). Therefore, BJC, not MACTEC, must present evidence to substantiate what BJC's believes is the fair value of the credits.

656. I find that BJC bears the burden of proof to establish the value of a credit for work that was deleted from the fixed-price Subcontract. I find that BJC offered

insufficient evidence to establish the value of its deleted work. Therefore, BJC is not entitled to the value of credits it seeks from this court for REAs 53, 56, and 60.

657. Given this lack of evidence, I find that BJC failed to satisfy its burden of proof to substantiate its backcharges as a matter of law.

3. MACTEC's Damages

658. For the foregoing reasons and citations to authority, MACTEC is entitled to recover the following damages.

Subcontract Balance and Retainage	\$2,726,398.20
REA/SCN Description	
SCN 041 Work rules	\$ 4,700.00
REA 050 Request Spill Supplies	8,498.54
REA 051 Contaminated Water	64,551.52
REA 052 Storm Damage	92,432.80
REA 053 Delete Guard Shack	(2,400.00)
REA 054 Haul Road Restrictions	0.00
REA 055 CLA Violation	0.00
REA 056 Pipe Abandonment	9,276.32
REA 057 Piezometer Installation	126,090.98
REA 059 Grass Seed Mix	44,526.00
REA 060 Wetlands Restoration *	21,304.92
REA 063 Weir Construction	91,059.80
REA 064 Hoisting Procedure Change	6,823.54
REA 065 DGT Test	228,930.46
REA 066 Acceleration	101,654.71
REA 069 Additional Vent Stone	814,585.00
REA 071 Haul Weight Restrictions	475,786.29
REA 073 UGT Excavation	26,371.62
Contour Fill Overruns	3,010,661.48
Extended Program Costs	<u>916,300.00</u>
Subtotal	\$8,767,552.18
Interest **	<u>1,076,767.64</u>
Total	\$9,844,319.82

* Credit is included in MACTEC's Subcontract balance claim. REA 60 consist solely of additional work.

** Interest through December 31, 2007.

659. MACTEC is also entitled to recover its costs, expenses, and attorneys' fees. MACTEC is to submit its Motion for Attorneys' Fees supported by a computation of time spent and the hourly rates charged by counsel for MACTEC and further supported by a memorandum of services rendered, to the Court within thirty (30) days from entry of the judgment.

4. BJC's False Claims Act Allegations are Meritless

660. Without any supporting information, evidence or even a claim, BJC requests that this Court recommend that BJC assert MACTEC's alleged False Claims Act violations to DOE's attention for further investigation.

661. A False Claims Act violation penalizes contractors that knowingly attempt to defraud the federal government, whether by actual knowledge of fraud, deliberate ignorance, or reckless disregard of the truth. See 31 U.S.C. § 3729(b)1- 3.

662. To constitute a violation of the False Claims Act, the contractor must knowingly present to an officer or employee of the government a false or fraudulent claim for payment or approval. See 31 U.S.C. § 3729(a)(1). A contractor will be deemed to have "knowingly" presented a false claim when that individual either has actual knowledge that the claim is false, or acts in "deliberate ignorance" or "reckless disregard" of the truth or falsity of the claim. See 31 U.S.C. § 3729(b); *see also Trafalgar House Constr., Inc. v. United States*, 77 Fed. Cl. 48, 52-53 (2007). MACTEC did neither.

663. Moreover, BJC failed to follow the procedural requirements of filing these claims under seal which is expressly required by a party bringing a *qui tam* action under the False Claims Act. See 31 U.S.C. §§3730(b)(1) and (2). These filing and service requirements were passed for the purpose of allowing the Government the opportunity to evaluate potential suits, while preventing defendants from having to answer harassing complaints and also protecting a defendant's reputation from a meritless action. See *United States v. Martin Marietta Corp.*, 60 F.3d 995, 999 (2nd Cir. 1995). In fact, courts have routinely dismissed False Claims actions for failure to follow this procedural requirement of filing claims under seal. *Id.* at 998-1000; see also *Erickson ex rel. United States v. Am. Inst. of Biological Servs.*, 716 F. Supp. 908, 912 (E.D. Va. 1989) (following the compliance principal set forth in *United States ex rel. Texas Portland Cement Co. v. McCord*, 233 U.S. 157, 162 (1913)).

664. BJC has failed to provide this court any evidence that MACTEC knowingly submitted a false claim. BJC's False Claims Act contentions set out in its Proposed Findings of Fact and Conclusions of Law constitute but another example of its bad faith. Accordingly, the court will not recommend that any BJC allegations regarding violations of the False claims Act be forwarded for investigation.

An order consistent with these findings of fact and conclusions of law will be entered.

ENTER:

s/ Thomas W. Phillips
United States District Judge